

Durham E-Theses

God, time and eternity: philosophical foundations for a defence of divine timelessness

Foyle, Stuart Mark

How to cite:

Foyle, Stuart Mark (2007) *God, time and eternity: philosophical foundations for a defence of divine timelessness*, Durham theses, Durham University. Available at Durham E-Theses Online:
<http://etheses.dur.ac.uk/2474/>

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full Durham E-Theses policy](#) for further details.

Academic Support Office, Durham University, University Office, Old Elvet, Durham DH1 3HP
e-mail: e-theses.admin@dur.ac.uk Tel: +44 0191 334 6107
<http://etheses.dur.ac.uk>

God, Time and Eternity:
Philosophical Foundations for a Defence of Divine Timelessness

Stuart Mark Foyle

The copyright of this thesis rests with the author or the university to which it was submitted. No quotation from it, or information derived from it may be published without the prior written consent of the author or university, and any information derived from it should be acknowledged.

Ph.D. Thesis

Department of Theology and Religion

University of Durham

2007



1 1 JUN 2008

Abstract

The past two decades have seen an almost exponential growth in publications on the topic of divine eternity and the general area of 'God and time'. Increasing appeal is made to arguments and resources which ranges widely through contemporary science and the philosophy of time, whilst retaining commitments to traditional historical and philosophical theology. This thesis aims to make a methodological contribution to the debate that will be of use to partisans of all views of divine temporality and atemporality, as well as to isolate more specific philosophical foundations which, it is urged, would be required for a defence of divine timelessness. In arguing for the plausibility of these foundations, a case is made for the desirability of such a defence.

This thesis argues for a methodology of constraints in which the key features are, first, that the theology of divine eternity can be affected by logical constraints introduced by arguments from 'outside' as well as 'inside' itself, and, second, that such a structure is reliant upon the integration of a corresponding understanding (provided by the work of Katherine Hawley) of how science might support metaphysical claims and how alleged support might be challenged. The resulting structure is offered as a general philosophical foundation for debates in the field of 'God and time'.

This thesis also argues that the most vital factor in the structure is the ontological status of the present. The denial that the present should be metaphysically favoured is explored, as a general philosophical foundation for a defence of divine timelessness, through topics in language and ontology, science, and epistemology. Results from this analysis are incorporated into the overall structure advocated by the thesis, together with considerations both of their effect on the debate, and of candidates for philosophical foundations from 'inside' theology which fit within the wider methodology of constraints on the theology of divine eternity.

Acknowledgements

There are a number of people and organisations without whom this thesis could not have been produced, or without whom it would have been impoverished in many ways. My thanks go to the Department of Theology & Religion in the University of Durham for supporting my study, to the AHRC for research funding (2003 – 2005), and to Dr.s Katherine Hawley, Stephen Read, and Sarah Sawyer for helping me to fall in love with metaphysics as an undergraduate. Particular thanks (and the firm promise never again to explain relativity theory to him in the style of fictitious characters from popular culture) go to my supervisor, Dr. Colin Crowder, who can only be described as the best man for the job. I would also like to express my gratitude to my examiners, Dr. David Wilkinson and Prof. Robin Le Poidevin, for their generous time and attention to my work; their own research projects continue to inspire me in mine. These acknowledgements would not be complete without thanking my parents for their unflagging support through the ups and downs of my life in education, but most especially I would like to thank my wife, Anastasia, without whom my time (whatever theory correctly describes it) would be infinitely less well-spent.

Contents

Introduction	p.4
Chapter I	p.12
Historical Resources: Theological and Philosophical Contexts	
Chapter II	p.44
Methodological Considerations: Science, Metaphysics, and Theology	
Chapter III	p.70
Philosophical Foundations: Constraints on Theories of Divine Eternity	
Chapter IV	p.100
The Status of the Present: Language, Facts and Ontology	
Chapter V	p.134
The Status of the Present: Science, Philosophy, and Interpretation	
Chapter VI	p.172
The Status of the Present: Epistemology, Experience, and Reality	
Chapter VII	p.198
Philosophical Foundations: Temporal Ontology and the Divine Nature	
Conclusion	p.224
Bibliography	p.227



I shall use the following abbreviations for sources in order to facilitate clear presentation (a statement of the full detail shall be made at the first instance of reference for each work contained in them):

CCAq : Norman Kretzmann, and Eleonore Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993)

CCAr : Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995),

I shall use the following abbreviations where appropriate for textual clarity:

STR : The Special Theory of Relativity

I declare that no part of the material of this thesis has previously been submitted for a degree in the University of Durham, or any other university.

The copyright of this thesis rests with the author. No quotation from it should be published without their prior written consent and information derived from it should be acknowledged.

‘Time again – time is the reef upon which all our frail
mystic ships are wrecked.’

‘You mean because it has never yet been proved that
the past the present and the future are not one and the
same thing?’

Noël Coward, *Blithe Spirit*

Introduction

My aim in the chapters that follow is to provide some philosophical foundations of a defence of divine timelessness, these being both methodological (how do we go about discussing God and time in the first place?) and also specifically focussed on philosophical elements that will ground arguments for, and accounts of, divine timelessness. But why, the critic might ask, would anyone want to defend divine timelessness when most theologians these days think that God must be in some way temporal? The simplest reply will invoke just those considerations, both generally methodological and more specific, that are to be found in the thesis. The best way to make things rather clearer is to explain all of this in terms of what the thesis is *not*, and why.

This thesis is not an open inquiry into divine eternity, seeking to arbitrate fairly between all the different views available on the basis of considering their grounds and supporting arguments. Such a work is a mammoth undertaking: William Lane Craig's synoptic assessment of the areas of debate runs to three volumes¹, well in excess of seven hundred pages, and there has been plenty written on the subject since. Nevertheless, my methodological discussion is not designed to be solely for the benefit of the defender of divine timelessness: my contention is that the structure I develop should be helpful for anyone debating 'God and time'; even its total rejection would aid the debate, since everyone would be clear on what was being rejected and why. Similarly, the defender of divine temporality may find here a useful resource for their project – primarily by virtue of seeing a need to rescue various of the more specific philosophical elements from criticism, for use in the philosophical foundations of their own undertaking.

This thesis is also not an exhaustive defence of divine timelessness, presenting extended and comprehensive arguments for the position and fashioning a coherent and complete account. For such a work would also be a vast project: Leftow's defence and account of divine timelessness² is well over three hundred pages, and Craig's work, whilst being a survey, is also a defence of divine temporality which supplies considerable critical material that the defender of divine timelessness would have to engage with. Work that has been done in the area since Leftow's monograph also

¹ William Lane Craig, *The Tenseless Theory of Time: A Critical Examination* (Dordrecht: Kluwer Academic Publishers, 2000); William Lane Craig, *The Tensed Theory of Time: A Critical Examination* (Dordrecht: Kluwer Academic Publishers, 2000); William Lane Craig, *God, Time, and Eternity* (Dordrecht: Kluwer Academic Publishers, 2001)

² Brian Leftow, *Time and Eternity* (Ithaca: Cornell University Press, 1991)

means that the defender of divine timelessness must work harder to differentiate their position from a variety of others (as opposed to simply from ‘unqualified divine temporality’³), and this means in terms of motivation and advantage as well as in terms of content. More nuanced positions that have been developed include Craig’s own position, which holds God to be timeless *sans* creation whilst the act of creation brings God into temporality⁴, and the view of Alan Padgett that God is outside created time⁵, but nevertheless basically temporal in an ‘unmetricated divine time’ reliant upon God’s being. Most recently, Garrett DeWeese has developed an account of omnitemporality⁶ which he attempts to distinguish from both Padgett’s and Craig’s positions.

The complexity alluded to above suggests that some sort of structure is required whereby we can identify how the various arguments interact, the relative importance of the bases they appeal to, and which issues are the most vital to address. But surely such a structure already exists, given the amount of work done in the field? I hope to persuade the reader in what follows that the answer to this question is unfortunately for the most part in the negative, and that it is time to remedy the situation. It will also become apparent that the closest candidates for such methodologies have been developed by those who then go on to argue for divine temporality; this might be considered reason enough to view things in terms of divine timelessness for a change. Even if it is not, I aim to provide a more direct reason to be interested in defending divine timelessness: that, within the more neutral methodological structure I suggest, the arguments constituting the topic of keenest debate – that is, the metaphysical status of the present – would be foundational to a defence of timelessness or temporality, and examining them leads us to conclusions that will favour the former, and not the latter. Thus, I present them (after having considered them myself) as philosophical foundations for a defence of divine timelessness, under the rationale that scholarship needs to see what such a structure and foundations look like, and preferably from the viewpoint of someone who is persuaded of their value. Whether a good account of divine timelessness can be provided through their use, and how that account would be developed, is a question for another thesis.

³ E.g. Nicholas Wolterstorff, ‘Unqualified Divine Temporality’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.187-213

⁴ For a brief treatment of this, see William Lane Craig, ‘Timelessness & Omnitemporality’, in Gregory E. Ganssle, (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.129-160

⁵ For a brief treatment of this, see Alan G. Padgett, ‘Eternity as Relative Timelessness’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.92-110

⁶ Garrett J. DeWeese, *God and the Nature of Time* (Aldershot: Ashgate, 2004)

In summary, then, what this thesis *is* about is how we ought to handle the topic of ‘God and time’, and more particularly how we ought to handle it if we are interested in what the once-popular traditional view of divine atemporality can have to say for itself in the current academic context.

I begin from an intuitive position expressed as follows: If we want to say something about God and time, we had better be able to say something about time. Philosophy and physics say a great deal about time, so the most important question is what their relationship with theology is, and how much of what they have to say we need to hear. I should note that I also begin by assuming that science, philosophy and theology in this field of study all make truth-claims – that is, that science makes claims about what we can expect to occur in reality under certain circumstances, that philosophy/metaphysics makes claims about the structure of that reality, and that theology makes claims about the existence and nature of God and God’s relation to reality. In short, whatever the case is in other areas of science, philosophy or theology, when we talk about relativistic effects on particle decay, the reality of the present moment, or the existence of God in a non-physical time, we are not just looking for ways to enrich our imaginative engagement with each other.

My exploration begins with history, since the defender of divine timelessness needs to know where the idea comes from, and the context of its development. Consequently, the first chapter of the thesis explores three classic sources: Augustine, Boethius and Thomas Aquinas. This yields the following points: First, that in its most developed form the (Thomistic) concept of divine timelessness seems to share the concern with philosophy and science – albeit in the context of the day, which is prior to the formation of the sciences as such. Nevertheless, Thomas makes full use of Aristotle, Averroes and Avicenna (whilst remaining indebted to the Neoplatonic roots of his intellectual tradition) in order to form his view. So my approach has some common ground with historical approaches.

Second, Augustine asks the same sort of question but does not necessarily have the apparatus to form the answers. He and Boethius demonstrate that there may be some issues which are distinctively theological in tone, entirely to do with God in God’s self or in His relation with human beings, which ought not to be papered over with reliance on philosophy and science. This acts as a reminder to be prepared to identify what issues these might be in the contemporary debate.

Finally, the importance of the overall philosophical context in Thomas’ development of divine timelessness will be seen, and how it flows naturally from other

questions. This is important because a change in philosophical context (in short, no longer relying on an Aristotelian or Neoplatonic worldview) may produce very different results even from similar approaches.

Having attended to the historical background, I turn to the bigger picture in its contemporary setting, with a question of methodology for the second chapter. If theology needs to relate to philosophy and science, how is this relationship to be conducted? I attempt, briefly, to illustrate the current state of engagement with science in the literature on ‘God and time’ and conclude that we are in need of a more rigorous methodological commitment than has been provided heretofore. The first step is to focus the inquiry on a ‘nuts and bolts’ level, regarding the demand for an arbitration of truth-claims that the debate seems to expect. A way to engage with this is made available by Katherine Hawley’s discussion of ‘science as a guide to metaphysics’⁷. She provides a structure within which to understand the following: first, the idea that a metaphysical claim may garner support from science (via the idea of ‘involvement’ in an empirically successful scientific theory); second, the options open to the critic of such a metaphysical claim, or the proponent of a rival claim; third, the importance of empirical adequacy and the implausibility of empirical data straightforwardly entailing metaphysical theses.

I argue that it is clear that theological claims will not operate in the same structure as Hawley’s science/metaphysics interaction, and, building on some work by Garret DeWeese⁸, I then develop a way of understanding a structure of boundaries or *constraints* on theology resulting (among other things) from science and philosophy. I suggest that the issue of divine eternity is an instance of philosophical theology incurring logical constraints from outside itself on account of the nature of the topic: these will spring, in the first instance, from the philosophy of time; however, if we are to take Hawley’s structure seriously her schema must be embedded in the methodology of constraints, since the ‘science of time’ may act as a guide to the philosophy of time, which will in turn place constraints on our view of God as temporal or atemporal. The philosophical foundations referred to in the title of the thesis must therefore be in two parts: first, an understanding of the methodology of constraints (which, why, and to what effect?), and second the principles or premises which provide the content of those constraints.

⁷ Katherine Hawley, ‘Science as a Guide to Metaphysics’, *Synthese* 149 (2006), pp.451-470

⁸ DeWeese, *God and the Nature of Time*, pp.4-7

The third chapter addresses the first of these parts. I introduce the terms of the contemporary debate regarding the philosophy of time and the theology of eternity, and demonstrate strong links between theories of time which emphasise the present metaphysically/ontologically (broadly, ‘tensed’ or ‘A’-theories) and theories of divine temporality, and similarly strong links between theories of time which deny such importance to the present (broadly, ‘tenseless’ or ‘B’-theories) and theories of divine atemporality. I argue for the construal of this in terms of constraints, these constituting, at their strongest, a serious bar to developing a particular theory of divine eternity when its antithetical theory of time is taken to be the superior. I illustrate the strength of this argument by reference to a growing acceptance and exposition of its component elements (in whole or part) in the contemporary literature.

The final part of the third chapter is dedicated to setting up discussion of issues that will identify the detailed contents of the constraints and the development of philosophical foundations for defence of divine timelessness. I argue that the idea of the present as ontologically favoured is the key to this process, and that critical engagement with theories that allocate maximum metaphysical importance to the present (which I term ‘presentist’ taken as the claim that only the present moment of time exists) are most likely to result in the removal of constraints barring divine atemporality and the augmentation of B-theoretical positions which promote divine atemporality. Craig’s work, as an extended argument for presentist theory and divine temporality, represents the primary source of such a bar on divine atemporality.

I focus on three areas of debate which integrate perfectly into the methodological structure developed from Hawley: language and ontology, the alleged incompatibility of ‘presentist’ A-theory with relativity theory, and the epistemological arguments over the importance of our experience of the present. Since the scientific incompatibility issue is generally taken as constituting support for B-theory from science, each of these three topics has components corresponding to a strategy of challenging such a ‘scientific metaphysics’. These are, broadly and respectively, independent arguments which may also augment a revisionary science; arguments challenging scientific support and/or providing a revisionary science; and arguments which could potentially overwhelm any scientific support, should it be *bona fide*.

Chapters four, five and six each take one of these topic areas and examine it. Chapter four is concerned with language and ontology: are there tensed facts, and what makes tensed and tenseless propositions true? I argue in favour of the view that treating something as ontologically significant on account of its role in language is a strategy

which demands extreme caution, and address three areas of interest. First, the presentist critique by Craig of Mellor's account of language and facts in *Real Time II*⁹, where I contend that a stalemate is reached in which Mellor's account can be considered successful only on the failure of A-theoretical/presentist theories resulting from separate arguments. Second, I assess arguments from Ted Sider claiming that the presentist cannot account for cross-time spatial relations or provide ontologically robust grounds for facts about the past. Once again, there is something of a stalemate since Sider refuses to consider scientifically revisionary presentist theories; if such were successfully argued for, perhaps the critique would lose some force. Finally, I analyse Craig's own model of presentism and argue that it is threatened by incoherence; it is therefore unable to marshal clinching independent arguments for the metaphysical importance of the present from consideration of the area of language and ontology. Whether it can marshal suitable arguments in the light of discussion of science remains to be seen.

The fifth chapter duly addresses considerations of science. This is split into several sections. In the first section, I trace the evolution of relativity theory, concentrating on the ideas involved and the motivations behind each development. This structure is then related to the methodology of involvement and constraint already considered, and arguments set out concerning relativity theory's alleged support for the tenseless philosophies of time, and its destruction of presentism. The key features here are, first, that empirical observations lead to specific theoretical content; second, that this content involves (in the relevant sense) a claim that there is no absolute present moment and that this claim is (in the relevant sense) supported by the empirically successful scientific theory; third, that this claim cannot be reconciled with presentism; this invites the conclusion that relativity theory provides a reason to deny ontological favour to the present.

In the second section, I look at Craig's use of a neo-Lorentzian approach to relativity and his rationale for employing it – likewise relating this to our methodological structure. The main points here are, first, that Craig regards several points of the formulation of relativity theory to be gratuitous and not demanded by the empirical content; second that he holds his selected neo-Lorentzian position to be adequate in relation to the empirical content; third that the neo-Lorentzian content involves a claim that there is an absolute present moment and that this claim is supported by the theory; finally, that by conducting his argument in this way Craig is

⁹ D. H. Mellor, *Real Time II* (Cambridge: Cambridge University Press: 1998)

buying into an optimistic view of science as able to lend support to metaphysical positions, and not attempting to rebut this view in favour of a more pessimistic one.

I then construct a critique of Craig's position, based both on an understanding of relativity theory and on how his position copes with the methodological demands. The key arguments here are, first, that Craig's criticisms of relativity theory do not succeed in casting doubt on it sufficiently to remove its support for the relevant metaphysical points (in the language of the methodological structure, it is not shown to be relevantly formulation-dependent, and it erroneously attempts to spread the failings of specific claims equally across all philosophical claims involved in the theory); second, that Craig's selected neo-Lorentzian theory does not attain full empirical adequacy, and that consequently it does not fulfil the requirements for grounding the claim(s) of an alternate metaphysic – i.e. presentism – and, finally, that the standard interpretation of the theory is explanatorily superior to Craig's approach (even giving him the most charitable options). Furthermore, and just as importantly, I argue that Craig has an inconsistent methodological approach in two respects: first, that when the science is unfriendly to his agenda he is pessimistic about the capacity for science to support metaphysics, whilst when the science is friendly to his agenda he is optimistic; second, that he presents his discussion of divine eternity as neutral pending arbitration of the A-vs. B-theory debate, but on the key issue in that debate (i.e. science) adduces to his argument for a neo-Lorentzian revision of relativity theory the consideration that a temporal God is to be desired.

Arguing that the presentist fails to establish a level scientific playing field, and that this casts further doubt on the ability of the arguments in chapter four to provide support for the presentist position, I turn to epistemological considerations in chapter six. The main points of the chapter are as follows: first, that what is at stake in Craig's discussion is not just the epistemic basis of tense, but the epistemic basis of presentism – this opens several critical opportunities for the defender of a tenseless approach, among them the argument that we may have temporal beliefs that are compatible with attributing presentness to things, events or experiences, but are incompatible with believing in a presentist metaphysic. Second, that a gap can also be opened up between our beliefs in the presentness of experiences, things, or events, and the belief that the present is ontologically favoured, and so (since Craig allows that physical theory can be an epistemic corrective) this opens up the possibility that failings in the scientific material will have a knock-on effect in his epistemological arguments. Third, that empirical phenomena, as opposed to scientific theory, may allow the defeat of belief in

the presentness of things/events/experiences, in addition to the defeat of beliefs in the present as metaphysically favoured, or beliefs in presentism. Finally, that Craig's use of the specious present (what can be spoken of or experienced as present) is vital to his response to the foregoing material, but deeply flawed both through his philosophical employment of it in his theory – something which is criticised in chapter four as well – and through the epistemic expectations he has for it, which are misplaced.

The seventh and final chapter attempts to bring the entire discussion together in a coherent whole. In the first section, I summarise the methodological and topical findings of the thesis, presenting suggested philosophical foundations for a defence of divine timelessness in terms of the methodology and structure I have argued for, of the denial of the ontological importance of the present which results from the various critiques of presentist metaphysics, and of the more cautious derivative elements which the discussions have given rise to. In the second section, I give examples of the foundations and structure of constraints in action, diagnosing the difficulties with two arguments for divine timelessness and critical responses to them, and showing how the approach I have argued for presents a better option for the defender of divine timelessness. In the third section, I look at two arguments that potentially provide philosophical foundations for a defence of divine timelessness but which are outside of the primary structure of constraints on which chapters three to six have concentrated – i.e. the category of logical constraints which come from 'outside' theology. I argue that they succeed in providing philosophical foundations of varying strength and are worth pursuing further, in terms of defence and exposition in philosophy of religion, and that they come within the wider structure of constraints that I develop in chapter three – in this case in the category of logical constraints developed within theology or philosophy of religion.

Chapter I – Historical Resources: Philosophical and Theological Contexts

Introduction

In this chapter, I wish briefly to consider some traditional and interconnected treatments of God's relationship to time. The main focus of this will be Thomas Aquinas, who specifically asks, in the *Summa Theologiae*¹⁰, what eternity is, whether it pertains to God and whether, if so, it pertains solely to God, and, in *De Aeternitate Mundi*, whether the world began to exist or has always existed. It might also be expected that Aquinas would have most to offer on the topic for reasons of historical context: scholasticism was at full throttle and the *Summas* (*Contra Gentiles* and *Theologiae*, but especially the latter) were attempts at more systematic out-workings of theology; furthermore, the argument over the eternity of the world was more urgent for Aquinas than for previous theologians on account of the influence of Arabic and Aristotelian ideas on the topic.

However, in the process of exploring these discussions in Aquinas, I shall also consider Augustine and Boethius, since they are – directly or indirectly – the main Christian authorities upon which he constructs his arguments. My aim is twofold: first, I want to establish concisely a picture of the traditional view of divine eternity, showing that – despite an historical interval of over eight hundred years between Augustine's consideration of eternity and Aquinas' work on the concept – a clearly compatible view emerges, which, through Boethius' intermediary arguments, forms the foundation of the so-called 'timeless view' of eternity. However, equally vitally, I wish to lay the foundations for a demonstration of the importance of science and philosophy for divine eternity, foundations which in Aquinas take the form of engagement with Aristotle, Moses Maimonides, Averroes and Avicenna. The concern here is not to show that the methodology espoused in this thesis is identical to that of a traditional defender of divine timelessness, or to give a complete historical methodological assessment. Rather, it is to show that, historically, divine timelessness was not developed and defended by a wholesale rejection of the philosophy/science of the day, but by an engagement with it – and thus to suggest that equivalent engagement should be sought by contemporary defenders of divine timelessness. This counts as much against those

¹⁰ Aquinas, *Summa Theologiae*, trans. T. McDermott (London: Eyre & Spottiswoode, 1964), Q.10; pp.135-143; hereafter in the format ST 1a.10.etc. excepting commentary

who would return solely to scholastic resources as a foundation of a defence as it does against those who would reject philosophical/scientific concerns as such.

Aquinas in Context

Questions of interpretation and method might be appropriate as a starting point. In particular, it is important to try to avoid the pitfalls of reading Aquinas too readily through modern eyes. The issue of how philosophy and theology relate for Aquinas is naturally a somewhat vexed one, but a few disclaimers and caveats are worth going in to.

Mark Jordan has argued that ‘no single work was written by Aquinas for the sake of setting forth a philosophy’¹¹, a claim which requires some clarification of both itself and other authors who chooses to see Aquinas as both philosopher and theologian. It is, at first glance, particularly contrastive with the article ‘Aquinas’ Philosophy in its Historical Setting’, with which it shares a book. The key distinction here is, I think, between ‘a philosophy’ and ‘philosophical commitments’. The essence of Jordan’s argument is that Aquinas doesn’t develop ‘a philosophy’ because he is a theologian and believes that, since philosophy takes on what is valuable in philosophy and transforms it in line with faith, to develop a philosophy would be a disappointing activity when there is so much theology to sort out. Aertsen affirms this in his own article when he explains that, for Aquinas, ‘philosophy offers no prospect of a fulfilment of human life’¹² because our final end is the vision of God, and not theoretical knowledge (by ‘philosophy’ he here means non-Christian reasoning)¹³. All of this does not of course equate to a lack of philosophical commitments, and Aertsen’s article is consequently, in part, an exercise in exploring what there is in Aquinas which is philosophically informative for us today, and how it is to be understood.

My first disclaimer, then, should be to note that I am not presuming to find in Aquinas ‘a philosophy of time’, or a defence of divine timelessness which is designed, explicable and debatable on purely philosophical terms. However, this does not mean that there will not be interesting philosophical material, or that philosophical and

¹¹ Mark D. Jordan, ‘Theology and Philosophy’, in Norman Kretzmann and Eleonore Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.233

¹² Jan A. Aertsen, ‘Aquinas’s Philosophy in its Historical Setting’, in Kretzmann and Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.33, cp Jordan, ‘Theology and Philosophy’, in *CCAq*, p.235

¹³ The fuller argument for this relies upon the Neoplatonic premise of the final end of a substance being a reuniting to its source (circularity of reality), the premise of God as source and the premise of intellect being the only way a human being can be united to its beginning.

theological commitments will not be identifiable. In particular, I am interested in the idea that it is Aquinas' philosophical commitments which facilitate his view of divine timelessness. The next point of discussion should be a clarification of exactly how philosophy and theology relate for Aquinas.

At the end of his article, Jordan has the following to say by way of summary:

We are left, then, with two responses from Aquinas to the modern reader's question about the relation of philosophy to theology. The first response is that the question must be reformulated so that it asks about theology's transforming incorporation of philosophy. Theology is related to philosophy as whole to part. The second response is that a Christian theology done well ought to speak more and better things about matters of concern to philosophy than the philosophers themselves can say. If a Christian theology cannot do this, Aquinas would not count it theology done well.¹⁴

Jordan's explication of the first of these responses makes use of Aquinas' analogy of 'water into wine' ('those who use philosophical texts in sacred teaching, by subjugating them to faith, do not mix water with wine, but turn water into wine'¹⁵). He characterises this subjugation by three points¹⁶: first, that theology can take on philosophical truth but grounds it in God; second, that theology can correct philosophy; third, that the motivation of the discourse must be Christian. He also suggests that, for Aquinas, theology strengthens and improves philosophy¹⁷.

Note that Owens, who uses the same analogy and quotation, employs a translation replacing 'subjugating them' with 'bringing them into the service of'¹⁸ – this might be thought to fit better with the idea that philosophy can do valuable work on its own without theology needing to 'control' it¹⁹ – something that Aertsen brings out when he explains on Aquinas' behalf that '[d]riven by the natural desire to know, it seeks the causes of what is seen and critically discusses the achievements of earlier thinkers.'²⁰ This guards against too strong a reading of Jordan's 'whole to part' relation for theology and philosophy.

Indeed, Aertsen complements Jordan's three points with three 'principles' of his own which characterise the relationship between philosophy and theology – principles

¹⁴ Jordan, 'Theology & Philosophy', in *CCAq*, p.248

¹⁵ In BDT 2.4, ad 5; Jordan, 'Theology & Philosophy', in *CCAq*, p.235; cf p.247.

¹⁶ Jordan, 'Theology & Philosophy', in *CCAq*, p.235-6

¹⁷ Jordan, 'Theology & Philosophy', in *CCAq*, p.247

¹⁸ Joseph Owens, 'Aquinas and Aristotle', in Norman Kretzmann and Eleonore Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.44 and n.9

¹⁹ Aertsen, 'Aquinas's Philosophy in its Historical Setting', in *CCAq*, p.35; cp p.27-28

²⁰ Aertsen, 'Aquinas's Philosophy in its Historical Setting', in *CCAq*, p.35

which themselves have corollaries in an article by John Wippel²¹. First, he says that the relationship is harmonious because both faith and reason come from God – their truths must therefore be compatible (even though faith takes precedence and reason can be defective)²². Second, philosophy cannot be reduced to theology, because ‘faith presupposes knowledge as grace presupposes nature’²³. Third, ‘faith is the perfection of natural knowledge’²⁴ because ‘grace does not destroy nature, but perfects it’²⁵ – consequently, philosophy can help provide an account of the truth of faith.²⁶

There is a sense to be had of the relationship between philosophy and theology in Aquinas as more of a spectrum than a definition: sometimes theology looks down on philosophy as dwelling in the penumbra of truth, and sometimes holds it up as a guiding light for faith. The key here seems to be in the second of Jordan’s responses on behalf of Aquinas, quoted above: Aquinas can identify some of the subject-matter and tasks of philosophy and theology without taking purely philosophical works as equal authorities with the deliverances of faith. Nowhere is this clearer than in Wippel’s assertion that ‘[f]or Aquinas, metaphysics, first philosophy and a philosophical science of the divine (*scientia divina*) are one and the same.’²⁷

The tensions, such as there are, in the above discussion may be seen to reflect Aquinas’ political and cultural context as much as anything. There was a delicate balancing act to be maintained for the theologian wishing to engage with Aristotle in the thirteenth century²⁸. Burrell’s reflections on this allow us a valuable methodological insight, for he says of Aquinas’ project:

It was questioned from two sides: the conservative Augustinians, who pretended to be invoking a pure tradition of faith against the “new learning,” and the Latin Averroists, who were so enamoured of Aristotle as to make of his teaching a virtual revelation for the philosophically minded.²⁹

²¹ Wippel, ‘Metaphysics’, in Norman Kretzmann and Eleonore Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), pp.85-127

²² Aertsen, ‘Aquinas’s Philosophy in its Historical Setting’, in *CCAq*, p.34; cp Wippel ‘Metaphysics’, in *CCAq*, p.86

²³ ST 1a 2.2 ad 1; Aertsen, ‘Aquinas’s Philosophy in its Historical Setting’, in *CCAq*, p.35; cp Wippel, ‘Metaphysics’, in *CCAq*, p.87

²⁴ Aertsen, ‘Aquinas’s Philosophy in its Historical Setting’, in *CCAq*, p.35

²⁵ ST 1a.1.8 ad 2

²⁶ Cp Wippel, ‘Metaphysics’, in *CCAq*, p.87; also Owens, ‘Aquinas and Aristotle’, in *CCAq*, p.44

²⁷ Wippel, ‘Metaphysics’, in *CCAq*, p.85; cf Aertsen, ‘Aquinas’s Philosophy in its Historical Setting’, in *CCAq*, p.32 quoting SCG 3.25 – note that this is not simply assertion but has grounds in the discussion of what these topics are, a discussion as important to Aristotle as to Aquinas (cp Barnes, ‘Metaphysics’, in Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), pp.66-108, especially pp.101-108

²⁸ For broad comments on this see Aertsen, ‘Aquinas’s Philosophy in its Historical Setting’, in *CCAq*, pp.20-27

²⁹ David B. Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in Norman Kretzmann and Eleonore Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993),

Welcome support for Aquinas, Burrell tells us, came from Moses Maimonides, whose *Guide for the Perplexed* became available in translation in the early thirteenth century, and whose approach to the relationship between reason and revelation aided Aquinas' own formulation, which we have been discussing³⁰. What all of this suggests, in addition to a more rounded view of Aquinas' intellectual foundations, is another caveat: Aquinas had to choose from a range of methodological and intellectual commitments and steered clear of the extremes that were available, the dangers of which are perhaps clearer to see at an historical distance. When faced with the temptation to make science, or indeed a specific church tradition, the only basket into which we put our theological eggs, wisdom may well still counsel caution.

Aquinas: Metaphysical Underpinnings

Having got a sense of the relationship between philosophy and theology for Aquinas, we can now go on to ask *what* philosophy is employed by (or incorporated into) Aquinas's work in his development of the theology of eternity. The key elements are Aristotelian, Neoplatonic and Islamic (Averroes and Avicenna), but before looking at their interactions, something more general should be noted. When we say 'philosophy' in this historical context we must understand the term to be broader than we might now intend by use of the word. Previous comments have tended to assume the content to be metaphysics (as the subject of being *qua* being, and thus as almost identical with the science of the divine) but it should be remembered that there were also categories of natural philosophy, or physics (being as a subject of motion) and mathematics (being as quantified). As Wippel observes, Aquinas discusses these topics and their definitions in *Expositio super librum Boethii De trinitate* 5.1, *Sententia super Peri hermenias* 1.1.3 and *Sententia super Metaphysicam* IV.1.532³¹.

This is important because natural philosophy and maths are closer to what we would now regard as science, and they abut/overlap metaphysics when it comes to Aquinas' discussion of time, as we shall see. Nevertheless, they are *not* what we would now regard as 'the practice of science' (Herbert Butterfield has argued that 'it was

p.70. Further discussion of the Augustinian side can be found in E. Gilson, *Pourquoi Saint Thomas a critiqué Saint Augustin* (Paris: J. Vrin, 1986), and of the Averroist side in O. Leaman, *Averroes and His Philosophy* (Oxford: Clarendon Press, 1988)

³⁰ Burrell, 'Aquinas and Islamic and Jewish Thinkers', in *CCAq*, p.70ff.

³¹ See Wippel, 'Metaphysics', in *CCAq*, p.85 and p.117 n.2

Aristotle rather than Ptolemy who had to be overthrown in the sixteenth century,³² in order to make room for the Copernican revolution; this is as much about the practice of science as it is about geocentrism versus heliocentrism), so one must be careful in what conclusions one draws. One thing that could be said is that 'Thomas Aquinas' notion of a science of nature owes a good deal to Aristotle's *Posterior Analytics*. He is in full agreement with the view that man has no knowledge, on earth, which does not originate in sense experience. In this St. Thomas is fundamentally an empiricist.³³ Consequently, although one might not be able to argue that Aquinas engages science much as he engages philosophy, one might still say that his philosophy in its entirety (including natural philosophy) is not inevitably opposed to scientific concerns as we now understand them, still less to theoretical structures which contemporary science uses to explain empirical data. Furthermore, his considerations of concepts as they impact upon the topics of time and eternity suggest a full and frank engagement with, as opposed to a rejection of, the discussions available to him concerning the nature of the physical world. This is sufficient to lend support to my methodological contention that the resourcing of traditional accounts of divine eternity should not exempt us from philosophically and scientifically responsible scholarship, suggesting that the modern defender of divine timelessness should take contemporary philosophy/science seriously even if they value theological tradition over contemporary philosophy as a starting point (and bearing in mind that taking something seriously does not mean taking it as universally authoritative).

Since a complete account of Aquinas' philosophical context and development would be excessive, I will restrict myself to four topics. First, I shall provide some brief notes concerning Neoplatonism – these will be referred to throughout much of the chapter as we discuss Aquinas and Boethius. Second, I shall discuss the distinction between essence and existence which Aquinas developed, showing its genesis through Greek and Islamic thought. Third, I shall outline the ideas of actuality, potentiality and change, showing how Aquinas' ideas of divine simplicity and immutability relate to them. Finally, I shall look at the concept of accidents, which Aquinas appropriates from Aristotle. Inevitably, on account of the structure of Aquinas' thought, these considerations will give us a sketch of Aquinas's views on time simply by showing the philosophical underpinnings of his work.

³² Herbert Butterfield, *The Origins of Modern Science* (New York: Free Press, 1997), p.35. Butterfield provides other examples of developments in science linked to the giving up of Aristotelian ideas.

³³ Vernon J. Bourke, 'Introduction' in Thomas Aquinas, *Commentary on Aristotle's Physics*, trans. R. J. Blackwell, R. J. Spath and W. E. Thirlkel (London: Routledge & Kegan Paul, 1963), p.xxvii

Turning to Neoplatonism, then, one might first observe, with Burrell, that two of the most authoritative texts of Aquinas' age – *The Theology of Aristotle* and *Liber De Causis* – were in fact works in extract and/or translation by the Neoplatonists Plotinus and Proclus respectively.³⁴ Since Aquinas was the first to point out the latter identification³⁵, we may presume a certain familiarity with Neoplatonic works (and that he knew what he was doing in this respect when he later uses the *Liber* when discussing divine eternity in ST1a.10.3) – a presumption which is reinforced when one is aware of his commentaries (unusually extensive for the thirteenth century³⁶) on Boethius, Pseudo-Dionysius and Proclus. This familiarity was a key component in Aquinas' ability to develop his innovative philosophical and theological manoeuvres, as we shall see.

Padgett sees Plutarch and Plotinus as, respectively, the first instance of associating timeless eternity with God, and the most extensive early out-working of absolute timelessness³⁷. In the emanative series of Being, Mind/Intelligence and Soul, eternity is the life of Mind and time the life of Soul.³⁸ Eternity, says Plotinus, 'is always the selfsame without extension or interval,'³⁹ which Padgett takes to mean 'without time and without duration.'⁴⁰ How did this impact Aquinas, and how in the philosophical underpinnings of his ideas did Aristotelian metaphysics and Neoplatonic philosophy interact?

A good place to begin is with a tension in Aristotle: he is interested in individuals (preferably medium-sized dry goods/creatures) as the fundamentals of knowledge and reality, but he has difficulty – in retrospect, at least – in fitting together how we know them with how we describe their composition. The interpretative difficulty arises because Aristotle discusses similar topics in both the *Categories* and the *Metaphysics*⁴¹ – in the former, he is more interested in classification, and in the latter more interested in composition; but beyond interpretation, this is also what gives rise to the tension. In the *Categories*, 'first substance' refers to individuals and 'second substance' to the corresponding universals (e.g. this horse versus 'horses' or 'horse-ness'). Second substance is secondary simply because it doesn't occur in reality except

³⁴ Burrell, 'Aquinas and Islamic and Jewish Thinkers', in *CCAq*, p.63

³⁵ Aertsen, 'Aquinas's Philosophy in its Historical Setting', in *CCAq*, p.22

³⁶ Aertsen, 'Aquinas's Philosophy in its Historical Setting', in *CCAq*, p.22

³⁷ Padgett, *God, Eternity, and the Nature of Time*, p.42-43

³⁸ Padgett, *God, Eternity, and the Nature of Time*, p.43 cf Plotinus, *Enneads* 3.7.11

³⁹ Plotinus, *Enneads* 3.7.3

⁴⁰ Padgett, *God, Eternity, and the Nature of Time*, p.43

⁴¹ Quite apart from the fact that the view of what metaphysics is has several variations in the *Metaphysics* – see Barnes, 'Metaphysics', in *CCAr*, pp.66-108 *passim*.

where there are individuals (there is no horse-ness without a horse).⁴² In the *Metaphysics*, things are more difficult because substance is discussed in terms of composition: ‘what is substance?’⁴³. Barnes puts it well:

Hence a tension – or rather, the threat of a simple inconsistency. Substances are individuals: Mozart is a substance, man is not. Substances are definable: man is a substance, Mozart is not.⁴⁴

Aristotle says in Book Delta of the *Metaphysics* that a substance is ‘a this so-and-so which is also separable’⁴⁵; Barnes suggests that this gives us the key to individuation, since one can specify individuation through a demonstrative and a commitment to the right sort of object as its demonstrandum (as Wippel nicely puts it ‘separate from other things in the sense that it cannot be ontologically communicated to them.’⁴⁶) The composition that Aristotle reaches is ‘matter plus form’, and the way he tries to unite this with the definability of the substance is with the concept of essence. As Barnes tiredly observes, although matter and form start off as simply stuff and shape, they soon get used in a broad range of ways (especially when describing the human being as body and soul). Matter takes on form to compose substance, and form frequently sounds like second substance – i.e. like a certain sort of universal. Essence is an attempt to get back a more definitional approach – what it is to be a so-and-so.⁴⁷ Wippel has a concise account of the situation:

In particular, one should not identify substance taken as ... essence with second substance. In matter-form composition, substance taken as essence...is related to substance taken as subject as formal part to concrete whole. But the concrete subject or whole includes individuating characteristics as well. Thus we cannot say “Socrates is humanity.” We can, however, predicate second substance of first substance, for instance, by saying “Socrates is a man.” It follows, therefore, that second substance is not to be identified with substance taken as essence.⁴⁸

Consequently, it can be suggested that an essence should be understood in part as ‘that *this* matter has *this* substantial form’, which gives a nod at getting around

⁴² See Robin Smith, ‘Logic’, in Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.55-56 and Barnes, ‘Metaphysics’, in *CCAr*, p.78-80 for more depth here

⁴³ Aristotle, *Metaphysics*, Zeta 1 1028b2-4

⁴⁴ Barnes, ‘Metaphysics’, in *CCAr*, p.91

⁴⁵ Aristotle, *Metaphysics*, Delta 8 1017b23-25

⁴⁶ Wippel, ‘Metaphysics’, in *CCAq*, p.107

⁴⁷ See Barnes, ‘Metaphysics’, in *CCAr*, p.99 in the context of p.97-100 for more depth.

⁴⁸ Wippel, ‘Metaphysics’, in *CCAq*, p.108

individuation by ‘demonstrative plus separability’ whilst emphasising that essence does not quite equate to form as an abstract genus.⁴⁹

Neoplatonism can be seen as attempting to get around all of this tension by concentrating on the concept of emanation. Taking Plotinus for a typical case, emanation employs a hierarchy of causation from the One, which is Being, through Intelligence and Soul – this could be characterised as a move from the more general to the more specific⁵⁰. Emphasis is then placed on essence, since the alternative, matter, is only ‘the receptacle for the unfolding of Soul in its lowest aspect, which projects the forms in three dimensional space’ and ‘has no positive existence’⁵¹. The approximate picture, then, is of individuals coming last as localised clusters of forms (i.e. essences). Clearly this simply swaps the tension of substance and essence for the problem of how to reconcile an Aristotelian view of individual entities as the main subjects of knowledge and reality, with a Neoplatonic view of emanative being and forms as ontologically prior. This is made clear, for Burrell, in Boethius, who utilises ‘the realist conception of universals prior to things (*ante res*) when needing to express their containing priority, and the conceptualist view of them as dependent on things (*post res*) when deferring to Aristotle’s insistence.’⁵²

Aquinas familiarity with Boethius, and Neoplatonism generally, helps him to develop a key feature of his theology – the essence/existence distinction. The final catalyst is the work of Avicenna, who, in Burrell’s words, is

less preoccupied with Aristotle’s quandary regarding the proper way to characterize existing individuals so as to secure their exemplary status, than he is to concerned to find a way of characterizing essences so that their existences in things may be properly explained.⁵³

What Avicenna brings to the table, as it were, is the idea that an essence can tell us what it is to be a table but not whether there actually *is* one. Avicenna’s deliberations get him as far as this:

identifying a new mode of composition in everything that is not necessary. It is a “composite duality” – not that of matter and form, which he presumes throughout, but one of essence (*mahiyya*) and some other factor that causes the individual thing to be.

⁴⁹ Stephen Everson, ‘Psychology’, in Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.171

⁵⁰ Cf Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in *CCAq*, p.64

⁵¹ John. M. Dillon, ‘Neoplatonism’, in Robert Audi (ed.), *The Cambridge Dictionary of Philosophy* (Cambridge: Cambridge University Press, 2nd ed. 1999), p.605

⁵² Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in *CCAq*, p.64

⁵³ Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in *CCAq*, p.65

That factor is never identified as such, although it would be tempting to identify it as *anniyya* ... yet ... *anniyya* expresses “the real existence of a particular individual” rather than identifying what it is that makes the individual exist.⁵⁴

Essence has thus been drawn far enough away from a Platonic or Neoplatonic commitment to the concrete separate existence of abstract universals to enable Aquinas to make the requisite step: to make ‘existence’ something that the individual has that means its essence is actual. That this was not a simple move can be seen from, first, the critical flak Avicenna’s work takes from Averroes’ misunderstanding it and deciding that existing was accidental for him⁵⁵, and, second, that after Aquinas’ death the existence/essence composition principle was embroiled in critical battle⁵⁶.

Nevertheless, the achievement undergirds much of Aquinas’ philosophical and theological progress, since it allows him (with strong justification) to identify metaphysics as the study of being as being whilst reasserting the importance of the individual entity as the subject of knowledge and categorisation of reality, thereby getting him out of Aristotelian trouble regarding substance and essence, and Neoplatonic trouble regarding emanation, in a more satisfying way than the haphazard Boethian approach. He gets out of Aristotelian trouble because he can talk about ‘being’ and about what it is for an entity to exist (or come to be) without having to provide an account resolving the concepts of first substance, second substance and essence using solely Aristotelian resources – but he can still concentrate on individual things in the world. He gets out of Neoplatonic trouble because he can talk about ‘being’ as something that individual things in the world *have* without having to suppose an emanative gulf between the two, or reducing being to an accident; individual entities are not an afterthought or final iteration of the infinitely more important ‘being’, nor are they simply a conglomeration of universals. Most importantly, it allows him to provide a link between God and the creature, by arguing that God is what gives existence to an individual entity, making it actual without that needing to imply causation of change in something already there.⁵⁷

By way of summary, allowing us to see clearly the connection with creation, Aertsen describes Aquinas’ view of the progression of philosophy as going through

⁵⁴ Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in *CCAq*, p.66

⁵⁵ Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in *CCAq*, p.69

⁵⁶ Wippel, ‘Metaphysics’, in *CCAq*, p.99ff.

⁵⁷ For more detail on this development, see Wippel, ‘Metaphysics’, in *CCAq*, p.100-103; Burrell, ‘Aquinas and Islamic and Jewish Thinkers’, in *CCAq*, p.68-70; Owens, ‘Aristotle and Aquinas’, in *CCAq*, p.49-52

three stages: alteration, generation and creation⁵⁸. The pre-Socratic philosophy allows for alteration, since a substance, which is matter, takes on accidental forms – changes in properties and relations as we might now see it. Aristotelian philosophy allows for generation, since matter is eternal and takes on substantial forms to become actualised as individual entities, which can then change in their accidents. But Aquinas' breakthrough of considering existence as such allows for creation, since it opens the question of a cause of being-at-all in addition to a cause of being-this(-rather-than-that) and being-this-thusly.

This philosophical evolution means that *creatio ex nihilo* (where *nihilo* means literally from no previous extant stuff, as Aquinas is at pains to point out against the philosophical presumption that the *nihilo* would refer to formless prime matter) is now a philosophical possibility to an extent which goes beyond assertion or internal coherence – after all, both Augustine and Anselm asserted it and made it coherent, as Aquinas was well aware⁵⁹. It is grounded in a strong metaphysical construction and understanding of what it is for an individual to exist. It also has important work to do laying the groundwork for Aquinas' treatment of divine eternity and of the debate over whether the world is eternal, as we shall soon see.

If we look again at Aertsen's characterisation of the progression of philosophy under the headings of alteration, generation and creation, having grasped roughly what the basis of creation is for Aquinas, the next step is to find an analysis of change. This in turn will enable a grasp of why, for Aquinas, God is simple and doesn't change – an important stage in understanding his view of God and time.

The core of change for Aristotle is the causing of matter to take on or alter form, although it should be noted that matter is a logical concept here rather than a specific 'stuff' (hence clay is the matter substrate which remains stable throughout the formation and destruction of a pot, but clay itself can be analysed as a composite and so could come to be or cease to be clay⁶⁰). This causation is four-fold and can fortuitously be illustrated by chocolate buttons: the *material* cause is the chocolate, the *formal* cause is button-ness, the *efficient* cause is the machine that injects and moulds chocolate, and the *final* cause is something like our desire for button-shaped chocolate.

⁵⁸ Aertsen, 'Aquinas's Philosophy in its Historical Setting', in *CCAq*, p.20-30

⁵⁹ In, for example, *De Aeternitate Mundi*.

⁶⁰ See R. J. Hankinson, 'Philosophy of Science', in Jonathan Barnes (ed.) *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.118-122 especially p.119, and Barnes, 'Metaphysics', in *CCAr*, p.94-98 for more detail

Aristotle uses the distinction of actuality and potentiality to do a lot of the work here.⁶¹ Potentiality describes a capacity for something to become actual through a cause; generally it is the case that it is matter that has the potential and the cause is efficient or final, but a substance can also be in potentiality with respect to something (e.g. Socrates with respect to being sunburnt). Since nothing is defined by its potentiality, potentiality is accidental and not essential. In a difficult move, Aristotle also makes actuality fundamentally prior to potentiality; the best we can make of this is that something must already be *x* in some way if it is to cause something else to be *x* (this is less problematic for motion, but more so for chocolate buttons).⁶²

For Aquinas, it is clear that Aristotelian metaphysics provides for accidental change and substantial change (roughly corresponding to the headings of alteration and generation): Wippel gives the example of a piece of wood being either a bed or a bench (accidental change) compared to air becoming water (substantial change)⁶³. Aquinas has different options to Aristotle, however, on account of his reasoning about existence, which we have already seen. First of all, ‘in composite entities, there is a twofold actuality-potentiality composition. Matter is potentiality with respect to substantial form. And material being’s composite essence is itself in potentiality with respect to the thing’s act of being (*esse*).’⁶⁴ (The essence is composite in a material being because it is subject to the limiting principle of prime matter, which also provides individuation⁶⁵). To clarify: the key move here is that any essence is potential until actualised by existence – this is a move outside of Aristotle’s capacity.

Aquinas can then do better with making actuality prior to potentiality because every essence is potential until caused to exist, and clearly only something that exists can cause something else to exist. This could be extended to reasoning that only something that exists can cause a change in another existent, which makes more sense than the Aristotelian ideas that Aquinas nevertheless supports.

All of this gives rise to the following line of argument: because essences need to be given existence, we require an existence-giver. Things cannot give themselves existence, since something needs to exist in order to act. Whatever gives existence cannot have an essence separate from its existence, since if it did the essence would

⁶¹ Perhaps too much work – see Barnes, ‘Metaphysics’, in *CCAr*, p.96, for comments on this.

⁶² See Barnes, ‘Metaphysics’, in *CCAr*, p.94-96 for more detailed treatment.

⁶³ Wippel, ‘Metaphysics’ in *CCAq*, p.110

⁶⁴ Wippel, ‘Metaphysics’, in *CCAq*, p.111

⁶⁵ By contrast, angels are not material and have no prime matter component in their essence – consequently Aquinas has to argue that each angel is a separate ‘species’, since individuation between two angels with the same defining essence is impossible – cf Wippel, ‘Metaphysics’, in *CCAq*, p.111-112

have to have received existence from something else before it could exist⁶⁶, and Aquinas will not accept infinite causal chains⁶⁷ as a resolution of that difficulty. This gets us to subsisting existence: an entity in which essence and existence are identical (note the echo of Neoplatonic Being as the primary reality, but *sans* emanative baggage). From here, we must affirm that subsisting existence is wholly actual, because there is nothing of it to be *actualised* – no essence which is not already actual, and no matter because there is no essence needing actualisation and individuation through material coming-to-be. This also fits with actuality being prior to potentiality; subsisting existence can actualise any potentiality and has no potentiality itself. It should be quite evident that there can be no accidental change or substantial change for subsisting existence. The former is ruled out because it requires matter and the concomitant potentiality, whilst the latter is ruled out because there is no matter and no form separate from existence itself.

Naturally enough, Aquinas' subsisting existence is indeed Aquinas' God. He even, with a philosophically cheeky flourish, makes the link between this view of subsisting existence and the Old Testament pronouncement of 'I am He who is'⁶⁸. The bare bones of the above description are fleshed out to become the foundations of divine simplicity and divine immutability. Mutability is comprehensively ruled out by most of the account, but can be summarised by 'lack of potentiality'. Simplicity is fundamentally true because God is the only one who is not a composite of essence and existence (since the two are identical), and not just because God is immutable as Augustine and Anselm described it⁶⁹. One ought to be able to see straightforwardly from this that there will be an effect on the doctrine of divine timelessness: Aquinas accepts Aristotle's definition in the *Physics* that time is 'the numbering of before and after in change'⁷⁰, so it follows that we should expect time not to apply to the simple, immutable God about which we have been talking. However, there is a second philosophical foundation to this position which is routed through the concept of accidents.

The final step, therefore, is a brief consideration of Aquinas adoption of Aristotelian accidents. Aristotle categorises the following nine accidents in addition to

⁶⁶ For a take on this from the angle of the metaphysics of participation, see Wippel, 'Metaphysics', in *CCAq*, p.94-95

⁶⁷ For the Islamic background in this see Burrell, 'Aquinas and Islamic and Jewish Thinkers', in *CCAq*, p.65-68

⁶⁸ ST 1a.13.11

⁶⁹ Brian Davies, "'Simple": Introduction', in Brian Davies (ed.), *Philosophy of Religion A Guide and Anthology* (Oxford: Oxford University Press, 2000), p.534-536 and n.14.

⁷⁰ Aristotle, *Physics*, IV, II.220a25, cited in ST 1a.10.3

the category of substance: (i) quantity, (ii) quality, (iii) relation, (iv) location, (v) time, (vi) position, (vii) having, (viii) doing and (ix) being affected⁷¹. To give a compact example: (i) two (ii) blonde (iii) giants were (iv) in the market place (v) yesterday, (vi) sitting (vii) wearing armour and (viii) throwing dice while (ix) getting sunburnt. Aquinas holds that there are ten categories, and that they are not reducible⁷². Emphasis should be placed here on the point that properties and relations are accidental insofar as they are not definitional of a substance – i.e. they are not in the essence of an entity. Wippel describes them as ‘different modes or ways in which being is realized’, when a substance (the first category) is being *per se*⁷³.

The category that we need to pay attention to here is that of time. From what we have seen, it should be clear that accidents require a potentiality and a cause to bring them about – if the substance exists already, then accidental change suffices, otherwise the essence will need to be given existence such that a potentiality is actualised both in terms of creation and substantial change, and then (not necessarily a temporal then, but a logical or ontological one) the substance can take on accidents.

The concept of God as subsisting existence, it is apparent, does not fit with the idea of having accidental properties. No essence is in potentiality to be actualised, no potentiality exists to take on various modes of being; philosophically, God is cut off from the possibility of having accidents. Since temporal qualification is among the categories of accidents, it follows that God’s being cannot be temporally modified, in the same way that God’s being cannot play dice or get sunburnt. It is also notable that the categories of accidents entail that God does not really have relations to the world (*x* sustains *y*), even though the world really has relations to God (*y* is sustained by *x*): as Craig observes, this permits a smooth avoidance of objections to divine timelessness based on God’s creative relationship with his temporal creation⁷⁴.

What I hope I have been able to show is just how much work Aquinas’ philosophical commitments (and indeed innovations) do in the development of his theology. This is important for three different reasons. First, and most obviously, it will make the discussion of his work on eternity more straightforward and less arcane or arbitrary for the modern reader. Second, it feeds into the methodological considerations with which my thesis is concerned, by showing how important philosophical developments were for Aquinas’ work – if there are good arguments for the interrelation

⁷¹ See Smith, ‘Logic’, in *CCAr*, p.55

⁷² See Wippel, ‘Metaphysics’, in *CCAq*, p.109 and further reading provided in his n.95

⁷³ Wippel, ‘Metaphysics’, in *CCAq*, p.92

⁷⁴ Craig, ‘The Tensed vs. Tenseless Theory of Time: A Watershed for the Conception of Divine Eternity’, in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.225

of philosophy and theology of time and eternity today (which I intend to show that there are) then we should expect no less of an interreliance. But no less importantly it shows that taking Aquinas as an authority on divine timelessness is not wise if it simply involves quoting his theological formulations – not even if it involves recourse to demonstrating how those formulations spring from others concerning divine simplicity and immutability – and it is certainly not wise to think that one can cherry-pick divine timelessness and disagree with Aquinas elsewhere. By and large the metaphysical milieu has altered enough, especially with regard to the concept of existence⁷⁵, that we should be highly cautious of adopting theological positions that demand problematic metaphysical commitments, and I hope this is a persuasive argument for persisting with the approach of this thesis.

Aquinas on Eternity

The Boethian definition of eternity is the cornerstone of Aquinas' discussion, and he quotes it almost immediately: 'eternity is the instantaneously whole and perfect possession of unending life.'⁷⁶ Aquinas engages with this definition in the usual scholastic way by first offering several objections, targeting various elements to varying degrees. In the first place, he asks whether we should employ a negation – 'unending' – in defining eternity, since this implies a defect where there is none⁷⁷. The thought here seems to be that being 'without an end' causes a tension with concepts such as 'whole and perfect', suggesting that something is lacking from the complex concept of eternity, which makes it less than it should be.

Secondly, he disputes that eternity is a concept which has to do with duration, suggesting that the correct ontological complement of eternity is not 'life', as Boethius has it, but 'existence', since 'duration is connected with existence rather than with life.'⁷⁸ On the same basis, Aquinas argues that possession is conceptually unconnected with duration, and that since eternity has to do with duration, the use of 'possession' in the definition is not correct.⁷⁹

⁷⁵ As the literature on the ontological argument alone will attest, see e.g. Graham Oppy, *Ontological Arguments and Belief in God* (Cambridge: Cambridge University Press, 1996) for bibliographical resources and literature review.

⁷⁶ De Consolatione v, prosa 6. PL 63, 858; ST Ia.10.1

⁷⁷ ST Ia.10.1 obj 1

⁷⁸ ST Ia.10.1 obj 2

⁷⁹ ST Ia.10.1 obj 6

Thirdly, Aquinas questions the conjunction of ‘whole and perfect’, saying that the former implies that eternity has parts on the grounds that ‘one uses the word “whole” of something having parts’⁸⁰, and if eternity is simple and has no parts then the word ‘whole’ is misleading or incorrect. He goes on to argue that ‘perfect’ is superfluous because ‘whole’ and ‘perfect’ have the same basic conceptual content.

Finally, he provides a Scriptural objection, citing Micah and St. Paul⁸¹, who both use the word ‘eternity’ in conjunction with ‘days’ and ‘times’ respectively (‘days of eternity’ and ‘times eternal’). Aquinas points out that ‘several days or several times cannot occur instantaneously.’⁸² He posits the conclusion that ‘eternity therefore is not instantaneously whole.’⁸³

There are two key arguments that Aquinas uses to construct replies to these points. The first, which he uses throughout the *Summa Theologiae*, is that we generally come to know the simple through the complex, or grasp what we do not know by using what we do know. In this case, the argument is that we come to know eternity through knowing time. The first objection, concerning negation, can therefore be answered by arguing that negation can be constructive; we need to negate the composite in order to grasp the simple, and clearly ‘unending’ removes the complex elements of beginning and end (‘for both may be regarded as ends’⁸⁴).

His second argument is that time ‘is merely the numbering of before and after in change’⁸⁵, which quotation he extracts from Aristotle’s *Physics* (IV, II.220a25). In other words, change implies succession and by numbering successive parts we obtain the phenomenon of time. Thus, Aquinas argues, the notion of something changeless produces the notion of something timeless: eternity. He characterises eternity in two propositions and employs these, together with the first argument, to answer the remaining objections. Essentially, eternity has no beginning or end, and no succession. Thus, first, ‘anything existing in eternity is unending, that is to say, lacks beginning and end,’ since, ‘one can assign a beginning and end to any changing thing.’⁸⁶ Secondly, ‘eternity itself exists as an instantaneous whole, lacking successiveness,’⁸⁷ since succession implies change.

⁸⁰ ST 1a.10.1 obj 3

⁸¹ ST 1a.10.1 obj 4; Micah 5:2; Romans 16:25.

⁸² ST 1a.10.1 obj 4

⁸³ ST 1a.10.1 obj 4

⁸⁴ ST 1a.10.1

⁸⁵ ST 1a.10.1

⁸⁶ ST 1a.10.1

⁸⁷ ST 1a.10.1

We can here see Aquinas' conception of eternity arising primarily out of his conception of change (which point we can relate to the philosophical underpinnings which we have already seen) – although it should be noted that here Aquinas is interested primarily in characterising eternity rather than God, and so does not make use of other points, for example concerning subsistent existence.

Aquinas answers some of the objections more convincingly than others. For instance, the objection to eternity being called 'whole' he defeats easily, saying 'eternity is called whole, not because it has parts, but because nothing is lacking to it.'⁸⁸ We can see the structure of his objection to using both 'whole' and 'perfect' more clearly in light of this: some may find it odd that Aquinas considers an objection relying upon the identity of these two concepts, but given that his interpretation of Boethius' definition takes 'whole' to mean 'nothing lacking' – which is much closer to the concept of perfection – we can see that the objection needs to be addressed. Aquinas does indeed address it, by the following argument⁸⁹. 'Instantaneously whole', he says, is used to emphasise that what is in eternity is not in time; eternity is not successive. 'Perfect', on the other hand, is used to remove the possibility that eternity as an instant is like a temporal instant; the latter is 'imperfect' in that it is only temporarily actual, as part of a succession, and is not 'whole' since it is only a part of the temporal sequence. Thus, 'instantaneously whole and perfect' means, for Aquinas, that eternity is neither successive (as time is) nor incomplete, like a 'frozen now', but rather is akin to an entire 'time' which consists solely in a 'now'. One might suggest the respective analogies of a still from a reel of film and a single photograph, where the first makes sense only as one of a succession of images, whereas the second stands alone for us to make what we will of it.

Concerning the Scriptural question, Aquinas reasonably points out that God is described in bodily terms and eternity in temporal terms, but that in both cases metaphor is being employed⁹⁰. Thus, the Scriptural uses of 'eternal/eternity' should not be considered normative for our technical definition of such terms.

Aquinas replies less convincingly to the objection which suggests favouring 'existence' over 'life' for Boethius' formulation, by saying that 'in point of fact, that which is eternal is not only existent but living,'⁹¹ that living is more associated with

⁸⁸ ST 1a.10.1 ad 3

⁸⁹ ST 1a.10.1 ad 5

⁹⁰ ST 1a.10.1 ad 4

⁹¹ ST 1a.10.1 ad 2

activity than is existence, and that duration may be seen in activity more than in existence.

Similarly, on the point of ‘possession’, Aquinas argues simply that ‘to possess something is to hold it firmly and immovably’⁹² and that the use of ‘possession’ signifies ‘the unchangeableness and constancy of eternity.’⁹³

Aquinas then turns his attention to the question of whether God is eternal. He cites four possible points against such an attribution. The first is again based upon Boethius, who says that ‘the flowing instant produces time, and the abiding instant eternity.’⁹⁴ Aquinas argues from this that God cannot be called eternal because ‘one cannot ascribe to God something produced.’⁹⁵ Similarly, he notes that Augustine states that ‘God is the source of eternity.’⁹⁶ Both Augustine and Boethius, therefore, could be accused of ruling out the attribution of eternity to God on these grounds. It is important to note that the Boethian point is a problem for Aquinas metaphysically because if something is produced then what it is produced in must in some way have potentiality (not a problem that Boethius would be thinking of, because he is operating within a Neoplatonic structure). Again, the Neoplatonic language is causing problems with the Augustinian point; presumably if eternity is produced by God, it is something other than existence – how can Aquinas fit this with his concept of God as subsistent existence?

Aquinas uses a parallel approach to argue that one cannot ascribe eternity to God because one cannot measure God, and ‘eternity is a sort of measure.’⁹⁷ He provides two further arguments based loosely on Scripture. The first is that eternity cannot measure that which exists before or after it, and yet the *Liber De Causis* and Exodus suggest that God exists respectively before and after eternity. Similarly, Aquinas notes that past, present and future cannot apply to eternity, and yet Scripture uses all three tenses when speaking of God. In all of these points, he asks whether God could in fact not be eternal.

Aquinas provides a strong reply to these problems, based upon the assumption (argued for in his previous chapter) of God’s unchangeableness. He argues that, if God is entirely changeless, as he has shown, then our concept of eternity must follow on from this. Thus, primarily, he argues that eternity is only ‘produced’ ‘according to our way of conceiving the situation.’ Boethius, therefore, must be speaking of how we

⁹² ST 1a.10.1 ad 6

⁹³ ST 1a.10.1 ad 6

⁹⁴ ST 1a.10.2; *De Trinitate* IV; PL 64, 1253

⁹⁵ ST 1a.10.2 obj 1

⁹⁶ ST 1a.10.2 obj 1; Liber 83 Quaest. 23; PL 40, 16

⁹⁷ ST 1a.10.2 obj 3

derive a concept of eternity (since we do not experience it as God does). Augustine's point – God as the source of eternity – Aquinas explains by considering it under the concept of 'shared eternity'; he wishes to assert that God can share His unchangeableness and His eternity with 'other things.'⁹⁸

Aquinas once again adopts the strategy of referral to the derivation of human concepts to address the problem of eternity as measure; he argues that in actuality 'God and eternity are the same thing...the notion of measurement arises only in our way of conceiving the situation.'⁹⁹ What Aquinas wishes to argue here should, for clarity, be split into two propositions. The first is that we think of temporal concepts as being a measure of time, with eternity being at one extreme – as the 'instantaneous present' without succession. It is a mistake, however, to place eternity on a spectrum; rather, eternity as timelessness is more akin to the absence of the temporal spectrum – this, it seems, is a presupposition taken from previous arguments, but we can also see how Aquinas would think of it as making evident sense within his metaphysical scaffolding – if time is an accident, atemporality is not placed on a spectrum with this as also accidental. Aquinas' second point, which is explicit, is that God is the only being who properly possesses and is its own eternity. This is reinforced in the next article, where Aquinas asks whether eternity belongs to God alone. Aquinas' grounds for equating eternity with God are underpinned by his concept of divine simplicity, for which he argues in Question 3 of the *Summa*, and therefore takes as already established – once again, we have seen the structural features of this already. The overall force of the point, then, is that our notion of any concepts having to do with time carries the implication of measurement of time, but not only is eternity a denial of temporality, it is also intrinsic to God rather than being a condition of God's existence. Eternity cannot, therefore, be applied to God as a measure without being in some sense erroneous, since it is neither external to God nor strictly a measure of duration.

Aquinas approaches the two objections from textual authority in a very similar way. His most direct and brief response is to the challenge that past, present and future tenses are used of God. He argues simply that these are used not because God changes and is in some sense 'subject to' past, present and future, but rather because '[God's] eternity comprehends all phases of time.'¹⁰⁰ In other words, God's relationship to time is such that His 'instantaneous now' has access to – envelops – all points of time; all times are 'now' for God, but we, who are temporally conditioned, must relate this to our

⁹⁸ Suggestions for this might include the angels, for example.

⁹⁹ ST 1a.10.2 ad 4

¹⁰⁰ ST 1a.10.2 ad 4

experience by employing tenses. It is notable that this is a more purely theological point; if it is underpinned by anything in particular, it would presumably be that whatever gives existence to everything must, if it is not temporally conditioned, have 'equal access' to everything in that giving.

The second textual challenge provides another avenue of exploration for this idea. The challenge is that scripture cites God as existing before and beyond eternity. Aquinas argues that God exists before eternity in the sense that God is eternal before He shares this eternity with anything else¹⁰¹. We might want to suggest that Aquinas has an idea of God as 'ontologically prior' to everything else (in terms of being subsistent existence), including time – an idea that we shall revisit when considering Augustine, but this should be marked out as distinct from what he is examining here. The concept of ontological priority applies more to the idea of time extending infinitely far back (vis a vis the debate over whether the world is 'eternal'), or to the problem of any concept of 'before time' (Aquinas and Augustine), whereas Aquinas is here attempting to deal with a more distinctly Neoplatonic point; eternity was claimed to be the duration of the emanation of Intelligence (as immaterial substance)¹⁰² from Being (the One). Hence the importance of establishing that eternity can be shared; Aquinas needs to emphasise that God is prior to eternity so that he cannot be criticised for making God in any way secondary, or an emanation, but he also needs to maintain that God is eternal in God's self. The notion of God sharing eternity is the method he chooses to resolve this tension.

In order to overcome the problem of God's existence 'beyond eternity', Aquinas notes that 'eternity', in Exodus, is synonymous with 'ages': 'So that God is said to reign beyond eternity because he outlasts all ages, outlasts, that is to say, any given duration.'¹⁰³ He goes on to complete the rebuttal by arguing that, if one were to allow eternity to mean instead 'everlasting', God 'would still reign beyond it, because his reign is instantaneously whole.'¹⁰⁴ This point will recur, both in Boethius and Augustine as well as in Aquinas, and is a key to the notion of eternity since it brings us to the idea of God's eternity as enveloping time, and being separate from, yet related to, time.

In the third article of the question, Aquinas asks whether eternity belongs to God alone. One may glean from the ensuing discussion further elucidation of Aquinas' view

¹⁰¹ ST 1a.10.2 ad 2

¹⁰² Aquinas, *Summa Theologiae*, trans. T. McDermott, p.141, n.a

¹⁰³ ST 1a.10.2 ad 2

¹⁰⁴ ST 1a.10.2 ad 2

of eternity. He makes three challenges; broadly, they are as follows. First, those who achieve heaven may become eternal.¹⁰⁵ Secondly, those who are sent to hell ‘depart...into eternal fire.’¹⁰⁶ These both reduce to essentially the same point: what is the case if our souls, or some other realm which is not God Himself, are eternal? Finally, Aquinas objects that ‘what is necessarily so is eternally so.’¹⁰⁷ Since various things – particularly certain propositions – are necessary, we may deduce that several things may be considered to be eternal.

The reply which Aquinas formulates is very direct: that God alone is eternal in the correct usage of that term. This effectively means that he must supply an explanation to resolve the three challenges considered above. Before doing so, he provides an exceptionally clear statement of his concept of eternity as argued for previously.

Eternity, in the true and proper sense, belongs to God alone, for eternity, we said, follows upon unchangeableness, and God alone, as we showed, is altogether unchangeable.¹⁰⁸

With this in mind, he re-emphasises and re-applies two points for which he has previously argued, in order to demonstrate that the three problems noted can be reconciled with his view of eternity. First, he argues that God ‘shares’ unchangeableness with some elements of creation; to the extent that anything shares in God’s unchangeableness, it shares in God’s eternity. This is a development of the point found in ST 1a.10.2 ad 1.¹⁰⁹

Secondly, he again raises the linguistic point that eternity is often used to mean merely ‘a long time’, and this echoes similar points made in ST 1a.10.1 ad 4 and ST 1a.10.2 ad 2. He links it on this occasion with the previous argument, suggesting that things which merely ‘endure for a long time’ partake to a lesser degree in God’s unchangeableness, and therefore to a lesser degree in God’s eternity.

Aquinas resolves the problems as follows. He argues that the angels and saints share in God’s unchangeableness and eternity ‘still more fully...as they contemplate God’¹¹⁰ than do any other creatures, and that consequently ‘one tells of many eternities

¹⁰⁵ ST 1a.10.3 obj 1

¹⁰⁶ ST 1a.10.3 obj 2

¹⁰⁷ ST 1a.10.3 obj 3

¹⁰⁸ ST 1a.10.3

¹⁰⁹ ST 1a.10.3

¹¹⁰ ST 1a.10.3

because many are the things sharing God's eternity by contemplating him.'¹¹¹ Hell, on the other hand, 'is called eternal only because it is unending,'¹¹² the idea being that one suffers for an infinitely long *time*, and 'the pains of hell include change.'¹¹³ Finally, Aquinas suggests a resolution of the problem of necessary things being eternal. He appeals to Aristotle's claim that truth resides in the mind, and argues that necessity is a mode of truth. Thus 'necessary truths are eternal only if they exist in the eternal mind, which is nothing other than God's mind.'¹¹⁴

It may be seen, therefore, that in dealing with the various problems facing his concept of eternity, Aquinas' key strategy is to ensure that we do not lose sight of the very specific concept of eternity that he wishes to propound. His other points, linguistic, logical or theological, are aligned to this purpose. The result is a keen sense, instilled in the reader, that one must differentiate the way we naturally think about time, and what we read about it, from the concept of God's relation to time that is derived from God's changlessness and simplicity. We must yet ask, however, to what extent Aquinas should be seen as a part of a tradition and to what extent an entirely original thinker in respect of this view of eternity.

Concerning Boethius

We have seen that Aquinas makes Boethius' definition of eternity the starting point of his explorations. The next logical step, therefore, if we require a fuller understanding of Aquinas' position and the 'timeless God' tradition of Divine eternity, is to turn to Boethius, who wrote about seven hundred and fifty years earlier than Aquinas.

In Book V of *The Consolation of Philosophy*, Boethius main concern is epistemic; he begins the sixth chapter with the following statement:

Since, therefore, as we have just shown, every object of knowledge is known not as a result of its own nature, but of the nature of those who comprehend it, let us now examine, as far as we may, the nature of the divine substance, so that we may also learn what is its mode of knowledge.¹¹⁵

¹¹¹ ST 1a.10.3 ad 1

¹¹² ST 1a.10.3 ad 2

¹¹³ ST 1a.10.3 ad 2

¹¹⁴ ST 1a.10.3 ad 3

¹¹⁵ De Consolatione v, prosa 6; Boethius, *The Consolation of Philosophy*, trans. V. Watts (London: Penguin, revised edition 1999), p.132 – *Consolation* references provided in dual version for ease of referral

He then outlines a concept of eternity as the foundation of an argument concerning free will and divine foreknowledge, which also forms the final argument of the work as a whole. The structure of his argument is as follows. First, he needs to establish that God knows and/or sees everything that occurs. His model of eternity is designed to accomplish this, but leads to the problem that God sees things seemingly 'before they happen', which could imply that humans cannot control what happens, or are in some way fated to perform certain actions. Boethius solves this by arguing essentially that God's foreknowledge makes states of affairs necessary in one sense but not in another; the necessity of foreknowledge is not *causal*, and we therefore have free will, but any state of affairs which we bring about becomes necessary in the sense that, once done, it cannot be undone. Expansion of this argument will both aid the exposition of Aquinas, and raise issues for future consideration, and to such an expansion I now turn.

Boethius begins by saying, as we have seen, that eternity is 'the complete, simultaneous [/instantaneous] and perfect possession of everlasting life'¹¹⁶. He uses the contrast of the creature in time, which 'is in the position of not yet possessing tomorrow when it has already lost yesterday'; there is no temporal thing 'which can embrace simultaneously the whole extent of its life'.¹¹⁷

Boethius goes on to make a distinction between eternity 'proper' and the eternity which should more properly be considered as simply 'everlasting'. Anything that is temporal, even if it is endless and had no beginning (Boethius cites Aristotle's view of the world as being eternal in this sense¹¹⁸) 'is still not such that it may properly be considered eternal.' This is so because '[i]ts life may be infinitely long, but it does not embrace and comprehend its whole extent simultaneously. It still lacks the future, while already having lost the past.'¹¹⁹

The truly eternal, then, 'will always be present to itself, controlling itself, and have present the infinity of fleeting time.'¹²⁰ Boethius uses Plato to consolidate his view, and in so doing also defends Plato from the accusation that he believed the world to be co-eternal with the Creator, 'for it is one thing to progress like the world in Plato's theory through everlasting life, and another thing to have embraced the whole of everlasting life in one simultaneous present.'¹²¹ Thus, 'God ought not to be considered

¹¹⁶ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.132

¹¹⁷ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.132-33

¹¹⁸ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.133

¹¹⁹ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.133

¹²⁰ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.133

¹²¹ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.133

as older than the created world in extent of time, but rather in the property of the immediacy of His nature.¹²² The thought here seems to be that if the world is everlasting, one cannot say that God is 'more everlasting', or that God existed 'before' the world, yet in some sense clearly God as Creator must be 'prior to' the existence of the everlasting world (we shall return to this when considering Augustine). Since Boethius is concerned primarily with knowledge, he chooses to present this as epistemic priority, portraying God as possessing already in an eternal present that which the world must traverse a temporal interval in order to possess. Boethius concludes that we should distinguish, with Plato, between God as 'eternal' and the world as 'perpetual'¹²³.

Having clarified his position, Boethius moves on to consider the particular issue of God's knowledge, which, he asserts, 'embraces all the infinite recesses of past and future and views them in the immediacy of its knowing as though they are happening in the present.'¹²⁴ Such a knowledge 'is better called providence or "looking forth" than prevision or "seeing beforehand". For it is far removed from matters below and looks forth at all things as though from a lofty peak above them.'¹²⁵ This is used by Aquinas in his analogy of the citadel from which one can see the whole of a parade, compared to those on the ground who can only see a part at a time¹²⁶.

Boethius then addresses the problem of foreknowledge *qua* necessitation; in other words, does God's knowledge of our future have a causal element? He argues that 'this divine foreknowledge does not change the nature and property of things; it simply sees things present to it exactly as they will happen at some time as future events.'¹²⁷ However, he does not find this sufficient to answer the problem.

If you say at this point that what God sees as a future event cannot but happen, and what cannot but happen, happens of necessity, and if you bind me to this word necessity, I shall have to admit that it is a matter of the firmest truth, but one which scarcely anyone but a student of divinity has been able to fathom.¹²⁸

Boethius therefore makes a second attempt to solve the problem. In this he employs a distinction between two sorts of necessity, which he calls simple and conditional. The examples which he employs are slightly confusing, in that they do not correspond to what we might choose in light of the progression of logic and modality since Boethius' time. He cites as a simple necessity 'that all men are mortal' and as a

¹²² De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.133

¹²³ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.134

¹²⁴ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.134

¹²⁵ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.134

¹²⁶ See *De Veritate* II.12; ST Ia.14.13 ad 3

¹²⁷ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.134

¹²⁸ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.135

conditional necessity that 'if you know someone is walking, it is necessary that he is walking.'¹²⁹ To clarify Boethius' point, we might choose the following examples instead. To exemplify simple necessity, one might say that it is necessary that an object cannot be both red *and* green all over, simultaneously. The clarification of conditional necessity is less demanding, but we might want to remove the epistemic element present in Boethius' example. Thus, an example of conditional necessity might be that, necessarily, if someone drops a golf ball off of a skyscraper in normal conditions then it will fall to the ground.

The point of the distinction between types of necessity is the affirmation of free will: I can choose whether or not to drop the golf ball, and if I choose to drop it I can predict what will happen to it; furthermore, I can choose to paint it red or green. I cannot, however, choose to have a golf ball that is both entirely red and entirely green all over at the same time. Boethius' argument is that God's knowledge of the future places future human actions in the category of the conditionally necessary, not that of the simply necessary: 'No necessity forces the man to walk who is making his way of his own free will, although it is necessary that he walks when he takes a step.'¹³⁰ Thus:

God sees those future events which happen of free will as present events; so that these things when considered with reference to God's sight of them do happen necessarily as a result of the condition of divine knowledge; but when considered in themselves they do not lose the absolute freedom of their nature.¹³¹

Boethius goes on to explain that it is impossible for two events which are happening not to be happening, and yet perfectly plausible that one came about necessarily and the other contingently. He uses the example of the sun rising and a man walking, the idea being that the latter involves free will and the former (as we would now put it) comes about because the Earth obeys certain laws of nature. The argument, then, is that just as we may observe an action without causing it, so by extension God may observe a future action without determining the agent in the present.

Boethius provides a further clarification by considering the question of whether one may 'escape' divine foreknowledge. He posits that 'if it lies in my power to change a proposed course of action, I will be able to evade Providence, for I will perhaps have altered things which Providence foreknows.'¹³² His response to this is that it is

¹²⁹ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.135

¹³⁰ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.135

¹³¹ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.135-6

¹³² De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.136

impossible and the reason for its impossibility encapsulates the essence of the compatibility of free will and Divine foreknowledge.

You can alter your plan, but since this is possible, and since whether you do so or in what way you change it is visible to Providence the ever present and true, you cannot escape divine foreknowledge, just as you cannot escape the sight of an eye that is present to watch, though of your own free will you may turn to a variety of actions.¹³³

Similarly, it is not the case that changing one's intentions for an event 'changes' the divine knowledge, in the way that many people have portrayed changing the past with a time machine as altering the future; rather, it is that God 'with one glance anticipates and embraces your changes in its constancy'.¹³⁴ So, for instance, at two separate times, t' and t'' , before event E , one has two consecutive intentions as to how to act at $E - I'$ and I'' – but discards all of them in favour of act A at the moment of E . It is not the case that at t'' , say, God's knowledge of A is exchanged for some A'' . Rather, there are three discreet moments represented by t' , t'' and E , and God eternally knows that I' , I'' and A correspond to those moments. This does not exert any causal force upon the agent.

In conclusion, then, what does Boethius' account of eternity amount to? We know that his concern is more epistemic than metaphysical in nature, yet we may still extract a coherent view for our purposes. Boethius' view of God is one of a God outside of time and yet related to it. Outside of time because God's possession of everlasting life is in an instantaneous/simultaneous present, and God's knowledge 'transcends all temporal change'¹³⁵; related to time because this God is not posited in such a way in order to be abstracted from the universe of human thought and experience but to be 'a spectator from on high of all things', and one who knows all that transpires in the universe, in our past, present and future.

The connection between Aquinas and Boethius, then, can be seen not simply as the quotation by the one of the other as a starting point to an original piece of work, but as a distinct view of eternity held in common. Although Aquinas does not consider Divine foreknowledge or omniscience under the heading of eternity, he does as we have seen, say that God's eternity 'comprehends all phases of time'.¹³⁶ This, taken

¹³³ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.136

¹³⁴ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.137. Again, this emphasises a distinction between how God would see things and how humans think of them. We have a 'plan' concept of intention, which means that we see 'outcomes' as changing dependent upon our current thoughts

¹³⁵ De Consolatione v, prosa 6; *The Consolation of Philosophy*, trans. V. Watts, p.134

¹³⁶ ST 1a.10.2 ad 4

epistemically, appears to be compatible with Boethius' arguments¹³⁷. Nevertheless, we must also be aware that Aquinas and Boethius are singing from different metaphysical hymn-sheets when it comes to underlying philosophical commitments. For this reason, perhaps the most important things that we can take with us from Boethius' work are, first, the concept of ontological priority (which for him is most likely to result from his Neoplatonic commitments) and, second, the idea of a divine perfect life lived 'all at once' with nothing lost to the past or yet to be gained from the future. This latter seems a more genuinely theological point, as opposed to more directly derivative from metaphysical commitments, and is something to which we shall return (particularly in the final chapter of the thesis where we examine the possibility of contemporary theological arguments which neither require nor assume prior metaphysical commitments).

To complete the view of both the 'tradition' of divine timelessness which reaches its conclusion in Aquinas, and of the philosophical commonalities and differences pertinent thereunto, some attention must be paid to Augustine, writing a little over a century before Boethius. We know that Aquinas was well aware of Augustine's work – and indeed, quoted him quite extensively in *De Aeternitate Mundi* during his vehement disagreement with those who thought that *creatio ex nihilo* and the proposition that the world has always existed are contradictory, where he suggests that if it were contradictory Augustine would certainly have pointed this out.¹³⁸

Augustine and Timelessness

Augustine opens Book XI of his *Confessions* with the following statement: 'Lord, eternity is yours, so you cannot be ignorant of what I tell you. Your vision of occurrences in time is not temporally conditioned.'¹³⁹ From this, he sets out to explore connected issues and problems, but it is important to note that we cannot yet assume that Augustine interprets eternity as timelessness. It is easy to read this into the quotation, but 'not temporally conditioned' could equally mean that God's perception or knowledge is not affected by time, which would be compatible with perfect memory and perfect foreknowledge but existence in time.

¹³⁷ Although Aquinas' own treatment of God's knowledge gives cause to question this compatibility.

¹³⁸ *De Aeternitate Mundi* 16

¹³⁹ *Conf.* 11.1.1; *Augustine: Confessions*, trans. H. Chadwick (Oxford: Oxford University Press, 1998), p.221 – *Confessions* references provided in dual version for ease of referral

Augustine begins with the Creation, briefly describing the idea of creation *ex nihilo* and emphasising the ontological priority of God over the universe.

The way, God, in which you made heaven and earth was not that you made them either in heaven or on earth...Nor did you make the universe within the framework of the universe. There was nowhere for it to be made before it was brought into existence.¹⁴⁰

This, combined with his primary statement, sketches a concept of God's eternal and non-spatial existence: God's knowledge is not time-dependent as ours is, implying that he is either outside of time as we have seen Boethius to posit, or within time but omniscient in such a way as not to be affected by time. The non-spatial concepts then incline us to favour the option of eternity as outside time, and indeed Augustine proceeds to set up a problem that will allow him to explore the links between atemporality and non-spatial existence, and question more closely the concept of God's eternity, and the relation between God and time.

Augustine first asks, therefore, whether God's speaking the Creation was subject to temporal succession¹⁴¹. Augustine argues that the Creation was accomplished through the Word, which 'is spoken eternally, and by it all things are uttered eternally.'¹⁴² Thus,

It is not the case that what was being said comes to an end, and something else is then said, so that everything is uttered in a succession with a conclusion, but everything is said in the simultaneity of eternity. Otherwise time and change would already exist, and there would not be a true eternity and true immortality.¹⁴³

He goes on to interpret the concept of 'beginning' in Genesis as being the same beginning as that 'Beginning' found in the Prologomenon of John, i.e. the Word; 'the source whence we have our being.'¹⁴⁴ Augustine wishes, then, to emphasise three things. First, the co-eternity of the Word with God; secondly, the inclusion of time within the created order, and finally the ontological rather than temporal priority of God over the Creation. In other words, the 'means' of creation is, being of one substance with God the Father, extant under the same conditions allotted to God - in this case, eternity. This entails that the Word was not temporally successive in any way, in relation either to God the Father or to Creation; hence, time must be a part of the

¹⁴⁰ *Conf.* 11.5.7; *Augustine: Confessions* p.225

¹⁴¹ Chadwick notes in relation to this that Plotinus, a key figure in Augustine's intellectual development, emphasised the temporal succession of human words. (*Augustine: Confessions*, trans. H. Chadwick, p.225, n.11)

¹⁴² *Conf.* 11.7.9; *Augustine: Confessions*, trans. H. Chadwick, p.226

¹⁴³ *Conf.* 11.7.9; *Augustine: Confessions*, trans. H. Chadwick, p.226

¹⁴⁴ *Conf.* 11.8.10; *Augustine: Confessions*, trans. H. Chadwick, p.227

creation. Since this is the case, it is problematic to think of anything as 'before' the creation in temporal terms, although clearly if God creates *ex nihilo*, then God must in some sense be prior to the created universe. These three elements follow logically in just the order presented, and are clearly grounded in a particular concept of eternity.

Augustine proceeds to clarify both the issue arising (just what is the 'before' relation that God has to the created universe?) and his conception of eternity by addressing the question of what God was doing before the Creation. He lays the problem out in the following way. If God is eternal in the sense of being outside time, and therefore changeless, then how could the Creation have come about, since if God was not creating and then created, then this implies that a change took place such that *before* there was not Creation and *afterward* there was Creation? So either Creation did not come about (which it plainly did), or God is not eternal, or Creation is eternal with God.

Augustine's answer to this challenge is to re-affirm and examine the idea that there was no time before Creation, because time was created with the rest of Creation. This allows him to emphasise God's relation to time, so conceived.

You have made time itself. Time could not elapse before you made time. But if time did not exist before heaven and earth, why do people ask what you were then doing? There was no 'then' when there was no time. It is not in time that you precede times.¹⁴⁵

He goes on to express his conception of eternity more fully. He makes a point familiar to us from Boethius' ideas, that eternity is 'always in the present' and yet embraces all of the past and future in a single non-successive eternal moment.

All your 'years' subsist in simultaneity, because they do not change...[they] are 'one day' and your 'day' is not any and every day but Today, because your Today does not yield to a tomorrow, nor did it follow on a yesterday. Your Today is eternity.¹⁴⁶

He also says, when distinguishing between time and eternity in *City of God* that 'the former does not exist without some movement and change, while in the latter there is no change at all'¹⁴⁷

It is clear, then, that Augustine's conception of God's eternity corresponds closely to Boethius' conception of eternity: God is outside time, and creates time – as He creates space – with the rest of the Creation. Thus, God is prior to Creation but not

¹⁴⁵ *Conf.* 11.8.15-16; *Augustine: Confessions*, trans. H. Chadwick, p.229-30

¹⁴⁶ *Conf.* 11.8.16; *Augustine: Confessions*, trans. H. Chadwick, p.230

¹⁴⁷ *De Civ. Dei* 11.6

temporally because this would require that time existed independent of Creation; likewise the Word of God by which God creates is co-eternal, and is therefore not successive in itself or in the relation between God and Creation. Augustine even touches on the issue of divine foreknowledge which we have seen to be of such importance to Boethius, using the contrasting analysis of a person singing a psalm to highlight the difference between our 'knowing' the future and God knowing the future. When I sing a psalm, Augustine explains, 'I have full knowledge of that psalm I sing. I know by heart how much of it has passed since the beginning, and what and how much remains until the end.'¹⁴⁸ However, God knows our past and future in a very different way. Our thoughts and experiences are extended in time, but God's are complete and outside time. Thus:

A person singing or listening...suffers a distension or stretching in feeling and in sense perception from the expectation of future sounds and the memory of past sound. With you [God] it is otherwise...Just as you knew heaven and earth in the beginning without that bringing any variation into your knowing, so you made heaven and earth in the beginning without that meaning a tension between past and future in your activity.¹⁴⁹

This brings Augustine's argument full circle to echo his opening remark: 'Lord, eternity is yours, so you cannot be ignorant of what I tell you. Your vision of occurrences in time is not temporally conditioned.'¹⁵⁰ We now have a far clearer picture of what Augustine means by this opening remark. In conclusion, then, Book XI of the *Confessions* gives us a good idea of Augustine's concept of eternity, both through his discussion of the Creation and God's relation to it, and through his own justification of divine foreknowledge. Augustine thinks of eternity as a 'simultaneous present', in which there is no succession or alteration, which places God and God's Word as ontologically, but not temporally, prior to the entirety of a creation which includes the temporal as well as the spatial. This means that God's knowledge of His creation is radically different to any creature's knowledge of it, a difference which must be expected, since the former is not temporally conditioned, whilst the latter is so conditioned.

Augustine's arguments can be helpfully compared with much of what Aquinas says. In particular, in view of the foregoing discussion, it is useful at this point to consider Aquinas' commentary on Aristotle's *Physics*, wherein he addresses arguments

¹⁴⁸ *Conf.* 11.31.41; *Augustine: Confessions*, trans. H. Chadwick, p.245

¹⁴⁹ *Conf.* 11.31.41; *Augustine: Confessions*, trans. H. Chadwick, p.245

¹⁵⁰ *Conf.* 11.1.1; *Augustine: Confessions*, trans. H. Chadwick, p.221

which are not found in the *Summa Theologiae*. The third paragraph of 989, for example, reads as follows:

For when we say that things were eternally produced by God, we do not mean that an infinite time has preceded in which God ceased from acting, and that after a determined time He began to act. Rather, we mean that God produced time and things together in being after they were not. And so we need not consider that the divine will willed to make things not then, but afterwards, as if time already existed. Rather, we need only consider that He willed that things and the time of their duration should begin to be after they were not.¹⁵¹

This certainly matches with Augustine's account of eternity as ontological priority, and Aquinas brings this together with his core conception of eternity in the last two paragraphs of 990. The comparison between Aquinas and both Augustine and Boethius (neither of whom he cites here) is striking:

There is, however, a duration before time, namely, the eternity of God, which has no extension of either before or after, as does time, but is a simultaneous whole. This does not have the same nature as time, just as divine magnitude is not the same as corporeal magnitude.

Thus, when we say that outside the world nothing exists except God, we do not posit any dimension outside the world. In the same way when we say that before the world nothing was, we do not posit a successive duration before the world.¹⁵²

However, we must remember that Augustine and Boethius did not have the concept of subsistent existence to work with and were operating from more distinctively Neoplatonic philosophical structures. Thus, a concept of ontological priority is available to all three, but in Augustine and Boethius it springs from a sense of God as the source of everything, whereas for Aquinas there is a more specific metaphysical structure of God as subsistent existence which actualises individuals. In the latter case the phrase 'God produced time and things together in being after they were not' has no whiff of emanative metaphysics but connotes pure act in individual creation.

In bringing together the work of Aquinas in the *Summa Theologiae* and in the *Commentary to Aristotle's Physics*, with both Augustine and Boethius, we have seen a clear strand of thought as it persists through approximately a millennium, even if the philosophical underpinnings vary. Although Augustine, Boethius and Aquinas all had different points of concern, and wrote with different aims in mind, there are also evident overlaps. We see in Augustine a concern with the interaction between Neoplatonic and

¹⁵¹ *Sent. Super Phys.* 8.2.989; Aquinas, *Commentary on Aristotle's Physics*, trans. R. J. Blackwell, R. J. Spath and W. E. Thirkel (London: Routledge & Kegan Paul, 1963), p.485

¹⁵² *Sent. Super Phys.* 8.2.990; *Commentary on Aristotle's Physics*, trans. R. J. Blackwell et al, p.487

Christian thought, in Boethius a similar interaction directed toward epistemic and moral concerns, and in Aquinas an engagement with Aristotle as well as a background of Neoplatonic thought, and an embedding of the issue of eternity within a larger and more systematic approach. Despite the differences in both historical period and intentions – visible most notably in Boethius’ concern with epistemic priority, and only secondarily with the ontological priority of God more clearly present in Augustine and Aquinas – the concept of a God outside time can be extracted with remarkable coherence from the three authors, and ought to be engaged with in a philosophically and historically responsible way as a foundation of a discussion of divine eternity.

Chapter II – Methodological Considerations: Science, Metaphysics, and Theology

Introduction

In the introduction to this thesis, I observed that if we are to say something about God and time, it seems *prima facie* advisable to look at what physics and philosophy have to say about time, since both clearly have a considerable *amount* to say about it. Having seen, historically, an engagement on the part of Aquinas (in particular, as a great exponent of this sort of enquiry) with a wide range of scholarship in his own time, what ought we to do about such an engagement with contemporary resources in philosophy and science, given their development and diversification? Before getting into the philosophical detail in the next chapter, I need to ask two questions: first, is there some structure into which we can place both science and philosophy that facilitates their interaction with theology in a rigorous, rather than arbitrary, fashion, allowing us to see the complex interrelations of the trio as required? And, second, how should we understand these interrelations, given that we cannot easily prise one apart from the others for separate consideration (for it seems clear that science and theology carry philosophical assumptions, theology and philosophy can presume or drift free of empirical data, and science and philosophy may affect or be affected by theological presuppositions)?

By way of clarification, I take the best sort of answers to these two questions to be answers which will not be simplistically over-determinative or reductive of these relationships, running a risk of rendering a caricatured structure that leaves no space for subtlety or flexibility. My concern, rather, is to find a way of minimising arbitrary (and therefore potentially misunderstanding-laden) employment of one discipline by another in such a way as to optimise the visibility of the flows of arguments and resources between them, and to do this in a way that will not only work for the case of ‘God and time’ but could be adapted for other cases as well. In short then, I think that good answers should reduce the complexity of the interrelations of science, philosophy and theology in the sense of reducing messiness, rather than in the sense of reducing variety and sophistication.

This chapter, therefore, comprises three main tasks. First, I shall ask what approach contemporary scholars in the field of ‘God and time’ have taken to the use of science in their philosophical/theological discussions. Finding a paucity of direct methodological material despite an increasingly scientifically involved range of

arguments, I then consider whether a structure can be developed so as to provide a scientifically and philosophically responsible approach.

The second section finds this structure in the work of Katherine Hawley, who outlines a suitable approach with regard to science as a guide to metaphysics. This suggests ways in which metaphysical claims might be held to be confirmed by science, and ways in which alleged confirmation might be responsibly challenged. I then enquire as to whether this can be applied *mutatis mutandis* to science and philosophy's relationship to theology.

The third section, then, argues that direct application of the same methods is inappropriate and that instead science and philosophy should be seen as placing boundaries and constraints on theology. This is rather different to providing means of confirming, disproving or otherwise straightforwardly *determining* theology. I conclude by observing the importance of holding in balance these interactions (science with philosophy, and both with theology), in line with the methods described. This will lead naturally in to the third chapter's consideration of the links between philosophies of time and theologies of divine eternity, and the sorts of constraints placed by the former on the latter. It also prepares the way for the extensive discussion of the impact of science on the debate, found in chapter five.

Structures in the Contemporary Debate

How have contemporary scholars of divine eternity approached the issue of how or whether science can inform the debate? There appear to be three tendencies: not to employ science, to make more or less arbitrary (or critically unreflective) use of it, and to place it within a philosophical structure to strengthen or weaken certain arguments – i.e. a more critically reflective use. In briefly exploring this spectrum in various works on the area, I aim to show that no-one has actually started from the methodological question of how to determine the legitimacy of scientific support/undermining of philosophical/theological claims. I can then go on to attempt an answer to this question in the remainder of the chapter.

Beginning with important works that come under the category of 'not employing science' in the divine eternity debate (noting that this should not necessarily be taken to

mean ‘deliberately ignoring science’) we can note that Nicholas Wolterstorff¹⁵³ does not engage with it and neither does Edward Wierenga¹⁵⁴, although interestingly the latter has the following to say in his introduction to *The Nature of God*:

One fascinating feature of the philosophy of religion is that it usually involves issues from other areas of philosophy; advances in the philosophy of religion always seem to require solutions to problems in metaphysics, epistemology, philosophy of language, or philosophical logic.¹⁵⁵

To some extent this is only a methodological step away from noting the addition of ‘philosophy of science’ or of science as an influence on other philosophical fields.

Moving on to the category of ‘critically unreflective use’ of science, one finds some variation. Elenore Stump and Norman Kretzmann, in their seminal article ‘Eternity’¹⁵⁶, make use of special relativity theory in order to provide analogous imagery and logic for their attempt to construct the concept of ‘eternal-temporal simultaneity’. However, they are ready to hedge their work about with disclaimers:

simply in order to set the stage for our characterization of ET-simultaneity, it will be helpful to look at a standard philosophical presentation of temporal simultaneity along Einsteinian lines... We want to leave aside the philosophical issues raised by this example and simply accept it for our present purposes as a standard example illustrating Einstein’s notion of the relativity of temporal simultaneity.¹⁵⁷

Also:

[the RT-simultaneity principle] and the Einsteinian conception of time as relative have served the only purpose we have for them in this paper, now that they have provided and introductory analogue for our characterization of ET-simultaneity, and we can now revert to a Newtonian conception of time, which will simplify the discussion without involving any relevant loss of precision.¹⁵⁸

And again:

And if it must be said that the absolute present is absolute only within a given observer’s reference frame, that will not affect our use of the concept here...

¹⁵³ Nicholas Wolterstorff, ‘God is Everlasting’ in Michael Peterson et al, *Philosophy of Religion: Selected Readings* (Oxford: Oxford University Press, 1996), p.309-320; “Unqualified Divine Temporality” in Gregory E. Ganssle (ed.) *God and Time: Four*, p.187-213

¹⁵⁴ Edward R. Wierenga, *The Nature of God*, pp.1-12 & pp.166-202; ‘Timelessness Out of Mind’ in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.153-164

¹⁵⁵ Wierenga, *The Nature of God*, p.8

¹⁵⁶ Eleonore Stump and Norman Kretzmann, ‘Eternity’, *Journal of Philosophy* 78 (1981), p.429-458

¹⁵⁷ Stump & Kretzmann, ‘Eternity’ p.437

¹⁵⁸ Stump & Kretzmann, ‘Eternity’ p.440

distinguishing individual reference frames for our discussion of time in the rest of this paper would be as inappropriate as taking an Einsteinian view of time in a discussion of historical chronology.¹⁵⁹

Setting aside how, why and to what extent Stump and Kretzmann have been criticised over ET-simultaneity, we can simply note that in some quarters their article has become a cautionary tale for the casual employer of science in philosophical and theological discussion. For instance, Padgett notes whilst criticising them for misunderstanding relativity theory:

Stump and Kretzmann claim that this discussion of relativity is merely a heuristic device (p.440). But even so, surely this idea is necessary to the demonstration of the coherence of ET-simultaneity, given the dependence of their explanation of its coherence upon relativity.¹⁶⁰

In the process of their own critiques of Stump and Kretzmann, related points are made by DeWeese¹⁶¹, who in pained terms decides to ‘confess that I find Stump’s and Kretzmann’s explication of ET-simultaneity quite puzzling on several counts,’¹⁶² and by Craig¹⁶³, who wraps up the first part of an eight-page shredding of ET-simultaneity with the following non-apology:

No doubt Stump and Kretzmann would cry foul at such a critique, in that I have pushed the analogy to Relativity Theory far beyond their intent. I concede the point, but then I simply cannot make sense out of the language of observation found in their definition nor of the metaphysical relativity appealed to in its explication.¹⁶⁴

By contrast, in his extensive work *Time and Eternity*, Brian Leftow provides a balanced and cautious treatment of Stump and Kretzmann but, concluding that ET-simultaneity raises more problems than it solves, decides to make a clean breast of things by looking for an alternative to their development of Boethian ideas, taking as his starting point some Anselmian thoughts on eternity¹⁶⁵. Nevertheless, the special theory of relativity is taken up enthusiastically for the purposes of several arguments. Does Leftow provide us with a methodological discussion of this? After a fashion:

¹⁵⁹ Stump & Kretzmann, ‘Eternity’ p.440 N.B. by ‘absolute present’ here Stump & Kretzmann seem to mean something like ‘our experience of now-ness’.

¹⁶⁰ Padgett, *God, Eternity, and the Nature of Time*, p.70-71 within the wider discussion of pp.69-72; see also ‘Eternity and the Special Theory of Relativity’, *International Philosophical Quarterly* 33:2 (1993), pp.219-223

¹⁶¹ DeWeese, *God and the Nature of Time*, p.164 within the wider discussion of pp.160-166

¹⁶² DeWeese, *God and the Nature of Time*, p.161

¹⁶³ Craig, *God, Time and Eternity*, p.88-96 within the wider discussion of pp.79-96; see also ‘The Special Theory of Relativity’, *Faith and Philosophy* 11 (1994), p.19-37

¹⁶⁴ Craig, *God, Time and Eternity*, p.93

¹⁶⁵ Leftow, *Time and Eternity*, p.216-217

One can say...that the finite speed of light shows us that space and time have a certain structure, that this structure accounts for the relativity of simultaneity, and that if space and time do have this structure, they have it objectively and so regardless of anyone's means of knowledge. ... that the temporalist is driven to deny the literal truth of STR confirms the validity of my argument's inference: if STR is true, as I am assuming, then a spaceless God is also timeless.

Leftow generally demonstrates a good understanding of STR, uses it well enough, and in this case makes a good epistemic argument (at least up to asserting that he assumes STR is 'true'). Nevertheless, in thirteen indexed uses of relativity theory, this is the closest Leftow gets to a methodological assertion (in this case, that STR is 'true') and the view it represents seems to warrant all sorts of employment of relativity theory in philosophical and theological arguments. This would perhaps not be terribly problematic if things were done in detail on a case-by-case basis – which in some instances, one could argue, they are, although in other places things are a little too casual (e.g. 'Current physics overwhelmingly confirms the claim that "time" and "space" just name abstracted aspects of a single reality, space-time'¹⁶⁶). However, Leftow spends fourteen pages at the outset of his work discussing 'working assumptions'¹⁶⁷ and it would surely make it easier for both him and his readership if some more extensive idea of how he views relativity theory was to be included in this, particularly if he is going to talk about people being 'driven to deny the literal truth' of relativity theory, as opposed to a more cautious 'challenge some philosophical or theoretical implications of relativity theory'.

Moving on to more critically reflective uses of science, one might begin with Alan Padgett. His approach might be summarised by his comment that 'STR teaches us a good deal about the world, but not all there is to know, even about time.'¹⁶⁸ In his monograph, Padgett gets into fairly detailed discussion of relativity theory, its assumptions, its interpretations, and to what extent it can be used to support various arguments in philosophy of time and theology of eternity¹⁶⁹. He also sets out some groundwork for this in his 'establishing the parameters' chapter, where he considers time measurement and metrics and how this can impact our thoughts on time¹⁷⁰. However, he does not really consider issues of method: how science can be used, and

¹⁶⁶ Leftow, *Time and Eternity*, p.24

¹⁶⁷ Leftow, *Time and Eternity*, pp.6-20

¹⁶⁸ Padgett, *God, Eternity, and the Nature of Time*, p.93

¹⁶⁹ Padgett, *God, Eternity, and the Nature of Time*, pp.82-95

¹⁷⁰ Padgett, *God, Eternity, and the Nature of Time*, pp.7-10 & pp.17-18

how science that is used can be challenged. Instead, he simply engages in direct argumentation when specific points arise.

Dean Zimmerman provides an interesting case with his article ‘God inside time and before creation’¹⁷¹. Here, he essentially says that he will be ignoring relativity of simultaneity and associated issues because, first, he will be talking about time pre-creation (and therefore prior to physical reference frames) and, second, because divine temporalists – of whose potential views he writes – generally adhere to philosophical viewpoints which require ‘getting around’ relativity theory in various ways. In short, then, he provides evidence that he has considered methodological issues, but based on a decision regarding suitable methods for his inquiry he is not going to discuss them because he doesn’t need to. One can hardly complain, but neither can one claim that here is a methodological consideration of the sort we would like.

Returning to monograph-sized considerations of God and time, two scholars stand out as providing the closest to a full methodological discussion of how science interacts with philosophy/theology. It is notable that they are also two of the authors publishing most recently on the topic.

William Lane Craig has written extensively on arguments involving the nexus of contemporary physics, philosophy of time and theology of eternity. His strategy, broadly speaking, is as follows:

- 1) To invoke a Newtonian view of absolute time as being the true (metaphysical) time of Divine duration, driving a wedge between this and physical time.
- 2) To allow relativity theory to correct Newtonian physical time, but to defend the possibility of metaphysical time on the grounds that relativity theory would excise it on verificationist grounds which are nowadays philosophically untenable.
- 3) To use the resultant epistemological undermining of proponents of relativity theory to discount standard interpretations in favour of a ‘Neo-Lorentzian’ interpretation of relativity theory.
- 4) Thereby to propose a coherent position in which God is temporal, the present is a vital ontological feature of reality, and modern science demonstrates a privileged reference frame corresponding to the present, which is also God’s present.

¹⁷¹ Dean W. Zimmerman, ‘God inside Time and before Creation’, in Ganssle and Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.75-94

However, despite all of this, there is not actually any discussion of what is appropriate, for example, about his epistemic challenge to certain interpretations of relativity theory in comparison with other challenges one might make, or indeed what criteria there are for admitting the kind of support that standard interpretations apparently give to certain philosophical and theological positions (which might be a good first step to deciding what sort of challenge to mount).

What we have instead is something more picturesque. For instance, opening his chapter on ‘the classical concept of time’:

Let us recur to the fount of the classical concept of time...of Sir Isaac Newton, with a view toward acquiring some insight into the concept of time in contemporary physics and its implications for one’s doctrine of divine eternity.¹⁷²

This is followed straightforwardly by expository material. Coming out at the other end, he rounds off his chapter conclusion with the claim that

Even if we do not go so far as Newton in including discourse about God in scientific theorizing, still it is clear that if we are prepared to draw metaphysical inferences about the nature of space, time, and spacetime on the basis of physical science, then we must also be ready to entertain theistic metaphysical hypotheses such as Newton deemed relevant.¹⁷³

Similarly, when criticising Leftow’s approach he is swift to say that it ‘evinces a certain naiveté concerning the philosophical foundations of the received physical interpretation of Relativity Theory and an uncritical acceptance of that interpretation.’¹⁷⁴ However, again there is no consideration of criteria or degree of engagement: what would count as a critical acceptance, and where do burdens of proof lie when debating the issue?

Garret DeWeese provides us with by far the most clearly presented methodological commitment in this area. We shall return to his wider methodological concerns later in the chapter, since a key feature of his introduction is as follows:

I believe that the search for a solution to God’s temporal mode of being and his relation to temporal creation should be shaped by certain constraints. I shall not offer arguments for the following constraints, but only indicate the role they play in guiding the dialectic of this project.¹⁷⁵

¹⁷² Craig, *God, Time and Eternity*, p. 143

¹⁷³ Craig, *God, Time and Eternity*, p. 162

¹⁷⁴ Craig, *God, Time and Eternity*, p. 107

¹⁷⁵ DeWeese, *God and the Nature of Time*, p. 5

By the end of this chapter and the next it should be clear that a large portion of this thesis is concerned with expanding upon the nature of these constraints, and the present chapter must therefore provide an adequate account of how and why such constraints should be structured in a particular way. In the meantime, let us ask a more specific question of DeWeese: namely, does he have a suitable view of how science should interact with philosophy and theology, and how it may be invoked as support, or challenged as inappropriate, within that interaction?

Speaking of philosophy of time and how it is affected by physics, he says that ‘a metaphysical theory that entails the denial of well-confirmed experimental results predicted by contemporary scientific theories would be highly suspect.’¹⁷⁶ Further, he makes the following observation whilst rejecting the idea that metaphysics is defunct or solely dependent on empirical science:

I believe that metaphysics is an independent enterprise. But independent does not mean isolated, and the deliverances of the empirical science constitute some of the evidence that metaphysical theories must explain. Conversely, since data will always underdetermine theory, purely metaphysical considerations should be brought to bear in the process of theory adjudication. A successful theory will result from respectful interaction between the scientist and the philosopher.¹⁷⁷

DeWeese’s approach could be distilled into some principles:

- 1) If a metaphysical claim entails the denial of good empirical data, this constitutes a reason to doubt the metaphysical claim.
- 2) Metaphysical theories are not straightforwardly entailed and solely determined by empirical science.
- 3) Metaphysical theories must explain empirical data, among other things.
- 4) Within the bounds of (1-3), non-empirical arguments contribute to the arbitration of metaphysical claims/theories.

This set of principles extracted from DeWeese gets us a long way to where we want to go, but it leaves some issues unaddressed and questions unanswered. If we have reason to doubt a metaphysical claim because it seems to conflict with successful empirical science, how should we go about reconciling them? What happens if the conflict is not between metaphysical theory and scientific *data*, but between metaphysical theory and scientific *theory*? Might there ever be non-empirical arguments that supersede scientific

¹⁷⁶ DeWeese, *God and the Nature of Time*, p.4

¹⁷⁷ DeWeese, *God and the Nature of Time*, p.6-7

ones? It seems we need a more precise structure if we are to avoid making bad moves in the game of interrelating science, philosophy and theology. Fortuitously, just such a structure is available.

In her recent 'Science as a Guide to Metaphysics', Katherine Hawley explores the often sharp differences of opinion that characterise the arguments in this area¹⁷⁸. This creates a desirable 'nuts and bolts' structure for understanding interactions between science and metaphysics, and which also allows interpretation of some of the critical moves made by those espousing 'scientific' metaphysics against more 'traditional' or 'alternate' metaphysics, and *vice versa*. I take Hawley's approach to be preferable on account of being more focussed and detailed when compared to other articles expressing interest in the area: for example, Michel Esfeld's article on science and metaphysics in which he describes the thesis of his paper to be that:

there is a mutual dependence between science and philosophy: philosophy in the sense of metaphysics needs science to know about what there is in the real world, and science needs philosophy in the sense of epistemology when it comes to developing criteria for the interpretation of scientific theories – that is, criteria for the assessment of knowledge claims contained in scientific theories¹⁷⁹.

He also says:

The justification for a revisionary metaphysics stems from science: our best scientific theories suggest the conclusion that a number of our common sense beliefs about the constituents of the world – as analysed by what Strawson calls descriptive metaphysics – are false.¹⁸⁰

However, beyond outlining examples of the development of 'scientific metaphysics', Esfeld does not provide further means of structuring or understanding either the way in which scientific resources impact metaphysical resources, or the criteria for acceptable challenges of metaphysics allegedly derived from science by independent metaphysical concerns. For the most part, this is because Esfeld is concerned to show how 'scientific results'¹⁸¹ give rise to revisionary metaphysics (i.e. revisions of our common-sense beliefs about the world and the accounts of reality we provide incorporating them), and thereby to show what 'scientific metaphysics' looks like.

¹⁷⁸ Katherine Hawley, 'Science as a Guide to Metaphysics', p.451-470

¹⁷⁹ Michel Esfeld, 'Metaphysics of Science Between Metaphysics and Science', for *Grazer Philosophische Studien*, special issue Alex Burri and Christian Beyer (eds.) *Philosophical Knowledge – Its Possibility and Scope*, January 2007, p. 1

¹⁸⁰ Michel Esfeld, 'Metaphysics of Science Between Metaphysics and Science', p.2

¹⁸¹ Michel Esfeld, 'Metaphysics of Science Between Metaphysics and Science', p.2

Hawley outlines ‘optimist’ and ‘pessimist’ positions and applies them to the increasingly fraught debate over whether the philosophy of time known as ‘presentism’ is defeated by considerations arising from the special theory of relativity and connected scientific and philosophical arguments. In providing a fairly detailed discussion of her work¹⁸², my interest is twofold: first and foremost, Hawley’s analysis, if agreeable, may prove extremely helpful to both that debate (which we must engage in chapter 5 as part of our wider discussion) and to the evaluation of Craig’s work more generally, which is a complementary concern throughout the thesis. Second, we may usefully ask whether the ideas Hawley outlines can be applied in modified form to the question of whether and how science and metaphysics may be allowed to guide theology. The third section of the chapter will develop an answer to this question by arguing for an understanding of science and metaphysics as possible constraints on, or boundaries for, theology – as opposed to determiners (proof or disproof, confirmation or denial) of theology. Having incorporated the material from Hawley into my considerations, I will be able to build on DeWeese’s observations to form a more streamlined and effective structure.

Science and Metaphysics

It may be prudent, in the first instance, to say something about what I take science and metaphysics to *be*. In part, what I take them to be (and what I think Hawley takes them to be) will become apparent through considering the question of whether and how science can act as a guide to metaphysics. It should be obvious that there is an assumption that the two are not identical, for example, and the sort of cases used to illustrate arguments in the following sections will provide more casual indications of what the remit of each is taken to be, and how their interaction highlights this¹⁸³. In terms of more specific description, these words from Jonathan Lowe seem an apposite starting point:

What is it, then, that metaphysics and physics have in common? Well, physics—and here I speak of modern physics—is an empirical science concerned to explain certain basic and ubiquitous phenomena in the natural world... Metaphysics is also concerned, though not exclusively, with the nature of things existing in space and time... But

¹⁸² Although the material explicitly referring to the special theory of relativity and presentism will have to wait its turn, later in the thesis.

¹⁸³ It ought also to become clear early on that the two are not unrelatable: even the most rampant metaphysical idealist would not deny that one observes certain phenomena, although the account given of them may be alien to any scientific explanation.

metaphysics is not at heart an empirical science—it does not typically appeal to experimental or observational data in support of its claims... its central concern is with *the fundamental structure of reality as a whole*.¹⁸⁴

One might ask the question of this section of the thesis in two parts: first, whether and how metaphysics should appeal to experimental or observational data; second, whether and how metaphysics should appeal to scientific theories which appeal to experimental or observational data. The way that these are phrased suggests working definitions of science as something relating *observations* of phenomena to *explanations* of phenomena through use of various theoretical structures and experimental methodologies, and of metaphysics as something which attempts to give an account of, or simply reason about, the nature of reality, using various conceptual structures and methodologies. Can definitions be given that *unproblematically* allow us to identify something as *either* metaphysics *or* science? I think not, but I think the problems that arise will result from the distinction between being and doing: there may be a scientific claim in a metaphysical theory where the metaphysician is adamant that they are ‘doing metaphysics’, or a metaphysical claim in a scientific theory where the scientist is adamant that they are ‘doing science’. But I think that the above working definitions and the discussion to come, below, give us reason to think that we can identify such scientific and metaphysical claims, and persuade the metaphysician and scientist of their presence in the respective theories.

To begin her exploration of the interaction between science and metaphysics, Hawley characterises ‘optimism’ and ‘pessimism’ as follows:

The first view, roughly, is that if a scientific finding seems to bear upon a metaphysical matter, then you ignore it at your peril. Call this the ‘optimist’ view, since it is optimistic about the possibility of achieving metaphysical progress on the back of scientific progress. The alternative ‘pessimistic’ view is, roughly, that you can only get as much metaphysics out of a scientific theory as was put in by hand in the first place.¹⁸⁵

The optimist, Hawley implies, would characterise the pessimist as prone to philosophical flights of fancy, and inclined to dismiss the empirical yardstick as conceptually impoverished. The pessimist would characterise the optimist as prone to buying into the conceptual baggage that accompanies scientific data, effectively treating the bathwater with the same respect as the baby.

¹⁸⁴ E. J. Lowe, *A Survey of Metaphysics* (Oxford: Oxford University Press, 2002), p.2-3

¹⁸⁵ Hawley, ‘Science as a Guide to Metaphysics’, p.453

Hawley encourages us to see both sides of the argument, pointing out that each has a core element of something important to say:

In line with optimism, it should be uncontroversial that our metaphysical beliefs ought to be empirically adequate, so long as 'empirically adequate' is understood to mean something like 'consistent with our beliefs about what we observe' or even 'consistent with the truth about what we observe'.¹⁸⁶

But in line with pessimism, it should also be uncontroversial that no interesting metaphysical view is simply entailed by what we observe, that the content of a metaphysical claim outruns its empirical consequences, and *a fortiori* outruns its consequences for what has in fact already been observed.¹⁸⁷

Hawley defends the 'core element' of optimism in several ways. She points out that the empirical adequacy is easily achievable using relevant auxiliary hypotheses; so we aren't saying that metaphysical content leads directly and simply to empirical content. She also points out that, if we are interested in truth and consistency when we seek good metaphysics, then the core element of optimism seems to follow. She further argues that there is no bar, in the 'optimistic core', on revising empirical beliefs as a result of metaphysical beliefs. Hawley observes that this core makes optimism plausible because we incline to linking empirical adequacy with scientific consistency on the grounds that science is empirically successful.

Let's take an illustrative example of the core of optimism: we might say that it is consistent with our observations of light, biology, and physical chemistry that we form the belief that colouration is reducible to microstructural properties of certain bodies; to be coloured *x* is just to have physical property *y*.¹⁸⁸ It is also consistent to form the belief that colouration is an experience caused in a conscious self by objects with specific dispositions, and that objects themselves cannot be said to be 'coloured' independent of a human observer¹⁸⁹. These (necessarily broad) characterisations of metaphysical considerations of 'colour' should not be independent of scientific descriptions of colour perception – involving the absorption of wavelengths of light, the light-sensitive structure of rods and cones in the eye, the operation of the optic nerve and the visual cortex, and other brain processes – and, indeed, should be consistent with them; this is the point of the optimistic core. It is not consistent with our observations of light, biology, and physical chemistry that we form the belief that colouration is

¹⁸⁶ Hawley, 'Science as a Guide to Metaphysics', p.454

¹⁸⁷ Hawley, 'Science as a Guide to Metaphysics', p.454

¹⁸⁸ For example, Thomas Reid's view has been associated with this position.

¹⁸⁹ For example, Dummett, Evans and McDowell have been associated with this position – generally with the addition of the standard proviso 'normal observers, normal conditions'.

reliant upon the existence of carrots in sufficient numbers: metaphysically and scientifically, if we believe this we have exceeded what is reasonable.

There are strong defences also of the ‘core element’ of pessimism, which Hawley similarly lays out. Foremost, the empirical adequacy suggested by a metaphysical view’s ‘fit’ within a coherent scientific view does not guarantee *truth*. Likewise, there may be incompatible metaphysical views with equal ‘fit’, so although we can use empirical adequacy as a desideratum, observes Hawley, we cannot call it truth.

Let’s look at an example of the pessimistic core. Returning to our colouration example, we could say that the physical properties of certain substances, together with certain biological facts about our colour-perception systems, entail that a normal person observing those substances under standard conditions will have an experience of a certain colour: it does not straightforwardly follow that colouration just *is* one or a set of physical properties of a substance. Additionally, if colouration just *is* microstructural properties of an object, there are more consequences than ‘if you see an object with this colour then it has these properties’; for instance, it may affect what sort of account you give of hallucination, or of the possibility of perceptual knowledge.

Having looked at the core elements, Hawley provides three views which accommodate what is uncontroversial in optimism and pessimism alike regarding involvement of metaphysical claims in an empirically successful scientific theory (henceforth ‘ESST’).

(Optimism) There are actual cases in which the involvement of a metaphysical claim in an [ESST] provides some reason to think that the claim is true.

...

(Radical Pessimism) The involvement of a metaphysical claim in an [ESST] can never provide any reason to think that the claim is true.

...

(Moderate Pessimism) There is a kind of involvement in theory which, were a metaphysical claim to achieve this involvement, would provide some reason to think the claim is true; but there are no cases of metaphysical claims being involved in theory in this way.

She then goes on to show how these accommodate the uncontroversial claims. The claim that metaphysical beliefs should be empirically adequate is compatible with both forms of pessimism because ‘to deny that metaphysical claims are confirmed by their roles in scientific theories is not to deny that metaphysical claims must be empirically

adequate.’¹⁹⁰ Incompatibility between a metaphysical claim and an ESST may be down to elements of the ESST that go beyond the empirical data; the metaphysical claim may still be empirically adequate.

The claim that no interesting metaphysical claim is simply entailed by the empirical data is compatible with optimism because ‘one can admit that involvement in an [ESST] does not entail the truth of a metaphysical claim whilst maintaining that it nevertheless provides some defensible *reason* to think that the claim is true.’¹⁹¹ (my italics). In the same way that we may prefer one scientific theory over another when they are empirically equivalent (because one may integrate better with other theories, or provide more explanatory power), so we may prefer one metaphysical claim over another, where more than one is compatible with the scientific material.

Hawley summarises:

Optimists and Moderate Pessimists have a common view about justification which differs sharply from that of Radical Pessimists; Optimists and Moderate Pessimists differ over whether science can ever satisfy the condition for justifying a metaphysical claim.¹⁹²

She moves on to discuss the relation between these three positions and that of scientific realism. Scientific realism is taken for the purposes of this thesis (and I am assuming for the purposes of Hawley’s paper, since she indicates no deviation) to be the position that ‘the subject matter of scientific research and scientific theories exists independently of our knowledge of it, and that the goal of science is the description and explanation of both observable and unobservable aspects of the world.’¹⁹³ This position entails that claims about unobservable entities can sensibly be made and are amenable to scientific confirmation or falsification.

Hawley argues that ‘scientific realists should reject Radical Pessimism and those who reject scientific realism should reject Optimism.’¹⁹⁴ The scientific realist who fails to reject Radical Pessimism seems committed to

¹⁹⁰ Hawley, ‘Science as a Guide to Metaphysics’, p.455

¹⁹¹ Hawley, ‘Science as a Guide to Metaphysics’, p.455-6

¹⁹² Hawley, ‘Science as a Guide to Metaphysics’, p.456

¹⁹³ J. D. Trout, ‘Scientific Realism’ in Robert Audi (ed.), *The Cambridge Dictionary of Philosophy* (Cambridge: Cambridge University Press, 2nd ed. 1999), p.821. Note that this is entirely compatible with ‘critical realism’, which takes an independent physical world to be the primary object of knowledge but asserts that physical objects are not directly present to consciousness, being instead mediated through mental states (broadly construed). Cf for example C. F. Delaney, ‘Critical Realism’ in Robert Audi (ed.), *The Cambridge Dictionary of Philosophy* (Cambridge: Cambridge University Press, 2nd ed. 1999), p.194

¹⁹⁴ Hawley, ‘Science as a Guide to Metaphysics’, p.456

finding some in-principle difference between claims about unobservable 'scientific' entities and 'metaphysical' claims, a difference which could explain why, although the former gain confirmation from their integration into successful scientific theories, the latter do not, even if they are just as integrated.¹⁹⁵

Candidates for this difference are unpersuasive. If metaphysical claims are accused of having the wrong semantic status (lacking truth values or assertoric mode) one reaches a level of instrumentalism about the metaphysical and realism about the scientific that sit ill with one another. If, as is historically the case, content has shifted from the area of metaphysics to science as the latter expands, it seems strange to think of such past claims as gaining assertoric status or truth-value over time. Hawley's paper also works from the standpoint that metaphysics *is* viable in its semantic status.¹⁹⁶

Moreover, the scientific realist accepts that there are topics which may be analysed using inference to the best explanation, and these overlap with the topics of metaphysics. Why then should they accept a pessimist position that empirically-derived evidence is simply not available for this process when discussing metaphysical claims as opposed to theoretical-scientific ones? It is not as if the pessimist position is suggesting that the evidence is available but *insufficient* for adjudicating the metaphysical claim in addition to the scientific claim for which it *is* sufficient. It just seems like an arbitrary decision to open the door to unobservable entities in science and close the door to metaphysical content at the same time.

Hawley goes on to provide two reasons for rejecting scientific realism which, she argues, lead respectively to radical and moderate pessimism in a straightforward way. The first reason for rejection is that 'one might think that the involvement of a claim about the unobservable in generating predictive success is irrelevant to whether we should believe it.'¹⁹⁷ This leads to radical pessimism, since taking this view of posited 'physical' entities suggests that one's view of metaphysical entities should be the same. The radical pessimist who believes in the possibility of metaphysics, then, is someone who thinks that we have distinctive methods of enquiry in that field¹⁹⁸.

The second reason is that 'one might simply think that claims about the unobservable never do any work in generating novel success.'¹⁹⁹ In other words, talk of electrons was good as a way of talking and explaining but didn't directly contribute to any ESST. This feeds into moderate pessimism, because it does not deny outright that a

¹⁹⁵ Hawley, 'Science as a Guide to Metaphysics', p.457

¹⁹⁶ Hawley, 'Science as a Guide to Metaphysics', p.457; cf p.452

¹⁹⁷ Hawley, 'Science as a Guide to Metaphysics', p.457

¹⁹⁸ Cf E. J. Lowe, *The Possibility of Metaphysics* (Oxford: Clarendon Press, 1998)

¹⁹⁹ Hawley, 'Science as a Guide to Metaphysics', p.457

claim about the unobservable could be involved in an ESST in such a way as to make the claim more plausible; it simply says that there just *isn't* this sort of involvement at the moment.

Hawley turns her attention to the nature of 'involvement' itself, since this is what distinguishes the optimistic and pessimistic positions if scientific realism is accepted. She begins with realist responses to the anti-realist accusation that historically there are empirically successful theories which posited entities in which we no longer believe. Given this, says the anti-realist, how can we say that empirical success is reliable for determining the truth of theoretical claims?

Hawley identifies two realist response strategies. The first is to argue that (especially if empirical success involves successful prediction beyond that originally intended by the theory) there are not in fact many historical ESST's on the 'discard' pile. This sort of debate between realists and anti-realists might take as its battleground something like the phlogiston theory of substances, combustion, and associated processes: did the theory have genuine empirical success, or did it really just account for experimental results after the fact?²⁰⁰ If the latter, it was not a genuine ESST when discarded.

The second response is that credit for empirical success need not be dispersed throughout a theory; empirical success does not licence equal belief in all elements of a theoretical structure, and some elements may be idle. For example, in the use of a miasma theory of disease before the development of the germ theory, one might argue that some empirical success was generated through more incidental elements of the theory – such as the importance of sanitary conditions – despite the actual ineffectiveness of the hypothesis of 'bad air' (as demonstrated by failure to deal with cholera).²⁰¹ If miasma theory could be taken as an ESST, this may not therefore licence belief in the existence of 'bad air' as described by the theory.

The bottom-line argument, then, is that 'there are very few cases in which a claim about the unobservable is supported by its involvement in generating empirical success, but later rejected.'²⁰² Building on this idea of involvement as empirical success leading to empirical confirmation, Hawley tries to lock down the mechanism of this involvement.

²⁰⁰ For background on the theory, see James Bryan Conant, ed., *The Overthrow of Phlogiston Theory: The Chemical Revolution of 1775–1789* (Cambridge: Harvard University Press, 1950)

²⁰¹ For discussion of the development and use of miasma theory, see for example M. Susser and E. Susser, 'Choosing a Future for Epidemiology: I. Eras and Paradigms', *American Journal of Public Health* 86:5 (1996), p.668-673

²⁰² Hawley, 'Science as a Guide to Metaphysics', p.458

Using the work of Stathis Psillos, Hawley suggests that a criterion for involvement with regard to the sort of entities that scientific realists and anti-realists debate about boils down to something like the following:

If a claim H is to be involved in generating a prediction in a way which entitles it to share in the confirmation which successful prediction brings (according to the scientific realist, at least), H must satisfy two conditions with respect to the generation of prediction. First, it must be the case that the theory-minus-H cannot generate the prediction alone. Second, it must also be the case that there is no available, sensible alternative to H which could have done the work just as well.²⁰³

By ‘sensible alternative’, we may understand ‘independently motivated, non ad hoc, potentially explanatory, etc.’²⁰⁴ In short, then, if we cannot come up with something that allows the theory to work without the particular theoretical baggage in question (including the simple or ‘special’ case of simply ripping it out), then we must conclude that it is not so much theoretical baggage after all, but rather fully involved theoretical content. By way of contrast, although it is a bit of a stretch, one might say that the claim of the existence of ‘bad air’ in miasma theory, when simply ripped out, might still allow a predicted reduction in instances of a disease in situations where sanitation is improved as the theory demands.

How will this translate to the case of optimism versus pessimism, where there is a disagreement over whether metaphysical claims actually are involved in generating empirical success? At a basic level, one can simply read the previous paragraph replacing ‘theoretical’ with ‘metaphysical’. Moderate pessimists and optimists therefore disagree over whether anything has actually succeeded in fulfilling the criterion of involvement thus formed.

When Hawley moves on to consider the situation in which optimistic and pessimistic metaphysicians find themselves (‘What should a metaphysician do if told that her favourite metaphysical theory is undermined by scientific findings?’²⁰⁵) she determines that, at first glance, there are two options for challenging a metaphysical claim seemingly embodied in science. First, one might challenge the empirical success of the theory. Second one might take disagreement between two theories (e.g. relativity and quantum theory) as a justification for caution or scepticism over the metaphysical consequences of both.

²⁰³ Hawley, ‘Science as a Guide to Metaphysics’, p.459; cf Stathis Psillos, *Scientific Realism: How Science Tracks Truth* (London: Routledge, 1999), p.110

²⁰⁴ Psillos, *Scientific Realism: How Science Tracks Truth*, p.110

²⁰⁵ Hawley, ‘Science as a Guide to Metaphysics’, p.459

Even if it accepted that the science is a good guide to empirical adequacy, there is a further challenge which is possible: to take one's alternate metaphysics and 'fit' it with the empirical content of the relevant scientific theory in such a way that there are no clashes which result in implausible empirical consequences. This gets one part of the way to challenging the metaphysics seemingly embodied in the science. One then requires either Undermining or Counterargument, argues Hawley, and she gives the following accounts of those strategies:

Undermining... is the attempt to show that the scientific metaphysic is not involved in generating novel prediction, and thus that its appearance in a scientific theory does not give us reason to think it true.²⁰⁶

This could be done either by finding a sensible replacement which is not *ad hoc* but also does not support the scientific metaphysic, or by re-formulating the scientific theory persuasively to show that the scientific metaphysic results from the formulation rather than the real content of the scientific theory. One must then provide separate, non-scientifically arbitrated, grounds for preferring one's alternative metaphysics over the scientific metaphysics one is challenging. Note that these grounds cannot be scientifically arbitrated because the effect of the first part of the challenge is to set a 'level playing field' of empirical adequacy: turning around at this point and claiming scientific support for one's alternate metaphysic would be roughly equivalent to persuading a Big Issue seller that you can't buy a Big Issue because you are as poor as they are, and then trying to persuade them to buy you lunch because, come to think of it, you would sell the Big Issue too, given half a chance.

The second strategy is Counterargument, which

accepts that the scientific metaphysics is genuinely confirmed by the role it plays in generating empirical success, but claims that independent reasons to believe the [alternative metaphysics] outweigh the scientific support.²⁰⁷

Hawley writes that, in accord with what we have discussed thus far, the alternative metaphysics must still be empirically adequate, but in this case a more *ad hoc* rival theory is sufficient to do the job because we are not attempting to remove the efficacy of the scientific metaphysics in the theory.

Hawley draws these elements together and relates them to the original cores of optimism and pessimism. The optimistic core of empirical adequacy for metaphysical

²⁰⁶ Hawley, 'Science as a Guide to Metaphysics', p.460

²⁰⁷ Hawley, 'Science as a Guide to Metaphysics', p.460

(as for other) beliefs and the suitability of contemporary science to providing a guide for such adequacy, is ‘reflected in the requirement that [the alternate metaphysics] must provide a system of beliefs which ... is empirically equivalent to scientific theory (or, depending where the burden of proof lies, scientific metaphysicians must show that this cannot be done).’²⁰⁸

Meanwhile, the pessimistic core - of empirical data being insufficient for direct entailment of interesting metaphysical positions - is reflected in the demand on scientific metaphysics to show its genuine involvement in empirical success generation (if the burden of proof lies on the alternate metaphysics, it must show no such involvement exists).

These concepts and structures will become vital later in the thesis, where we must decide how far we should allow our science to guide our metaphysics in the case of time, and whether the challenges presented by those arguing a pessimistic viewpoint with regard to the metaphysics of time are strong enough to overcome what appear to be good reasons to be optimistic on the subject – indeed, also whether those arguing a pessimistic viewpoint are genuinely pessimistic after all. In particular, we shall relate an argument by Yuri Balashov and Michael Janssen (against William Craig’s view) to the ideas laid out by Hawley, making the argument both clearer and more powerful as we see the extent of its force. This in turn will provide an important contribution to the question of what a defender of divine timelessness should be turning to as a resource for their proposal.

However, in terms of methodology we are only part way through the story. Having laid out some resources for thinking about science as a guide to metaphysics, how then should we approach the question of how far (or whether) science and metaphysics should be a guide to theology? If we cannot make sense of this issue, we will be ill-placed to determine how the philosophy and science impacting our view of time can be resourced in our theological reflections.

Science, Metaphysics, and Theology

The structure in the case of science and metaphysics ‘guiding’ theology seems liable to be different for several reasons. First, theological claims are not present in either science or metaphysics as elements for which the success of their host structure provides confirmation or support. Second, insofar as theology is bound by concerns of

²⁰⁸ Hawley, ‘Science as a Guide to Metaphysics’, p.461

consistency with philosophy or science, the augmentation by auxiliary hypotheses of a theological claim in principle (if not in practice) provides greater room for manoeuvre than analogical metaphysical claims in science. Finally, theology frequently treats of topics that are bound up with human responses to the world and to themselves, which makes theology as (or more) likely to be discussing value as truth-value.

At the same time, there are obvious logical links to be made. If we hold that God created everything (not just as a way of saying something about the value of the world, but as a direct ascription of a causal activity to an entity) and an ESST leads to the discovery of a certain thing (say a chemical element²⁰⁹), we cannot hold both that God created everything and that God did not create the substance in question. The crux of the question thus becomes ‘did God cause the nature of the universe to be x ?’ where x constitutes (the result of) a metaphysical claim. Thus, to the extent that an ESST supports the assertion of x , that ESST can restrict the logical possibilities of God’s action and nature *after the fact* (i.e. I am not here denying that God could have acted differently, I am simply asserting that *given* God’s action in one respect, logical limitations are present). In other words, for our purposes, if the nature of the universe is to have a specific temporal character, it may not be consistent with a God who is both changeless and responds to His creation, *given* that God has indeed created.

It can be argued, then, that if science and metaphysics act as guides to theology, it is because they place constraints or boundaries rather than because their success lends confirmation to theological claims. In short, one might say that theology too should be empirically adequate. However, one key feature is that, if we wish to challenge a putative constraint theologically, it is not sufficient to provide an *ad hoc* theological model if this model would have repercussions on the science and metaphysics forming the constraint. Under such circumstances, the theologian (much as the alternate metaphysician) has to show how any metaphysical or empirical consequences are cashed out and made acceptable.

For example, if an ESST demonstrates clearly that the universe’s structure is such that it does not have a ‘first moment of time’, this places a constraint on theology. If a theologian wishes to argue that God created a world in temporal series and began by creating a first moment of time, it is not enough simply to develop a theological model of this. The model will not (*prima facie*) be empirically adequate, because it is making

²⁰⁹ Cf the development of the periodic table of elements, where certain discoveries were made on the basis of theoretical prediction of what elements should exist and their properties. For extensive material on this, see Stephen G. Brush, ‘The Reception of Mendeleev’s Periodic Law in America and Britain’, *Isis* 87:4 (1996), p.595-628

a claim which, for the sake of argument, is straightforwardly false in the ESST. The theologian, then, must be able to show:

- 1) That the model is an exercise in counterfactuals, arguing the best option for the case where the ESST turns out to be wrong somehow. Or..
- 2) That the claim about time in the ESST is not involved in making the scientific theory empirically successful. Or..
- 3) That the claim in the ESST is formulation-dependent; other formulations would be compatible with a first moment of time. Or..
- 4) That there is a semantic issue which, when resolved, brings the model and the ESST into compatibility (although there may be repercussions elsewhere in theology).

Clearly, some of the above corresponds to strategies or ideas developed in Hawley's paper, and may involve serious commitment on the part of the theologian to understanding and working with the relevant science. Equally clearly, there may be relatively few claims made by a theological model that would be *straightforwardly* false in an ESST, which lends credence to pursuing the options above and does not simply equate speculative theology with claims which fail to be empirically adequate.

Let us turn to consider what sort of constraints science and metaphysics may reasonably be said to place on theology. As I noted in passing in the first section of this chapter, DeWeese briefly canvasses some constraints that he sees as shaping the development of a theory of God and time. We saw only one in detail, when I derived some principles regarding scientific constraint on metaphysics from his comments. This has now been overtaken by the more detailed treatment given by Hawley, and has been extended by some general considerations of how it might apply (or not) to the nexus of science, philosophy and theology. Another constraint he suggests is that of greater explanatory power as a criterion of judging between different theories. As a general point this is self-explanatory, but we shall return to consider it in more detail below.

There are three other constraints which DeWeese states, and these should be noted in passing. The first is 'biblical exegesis'. The second is 'pre-philosophical intuitions'. The third is 'historical theological tradition'. In this instance, I am taking biblical exegesis to be hugely underdetermining of a rigorous view of divine eternity. There are moves to be made in all directions, and consideration of these can be

accessibly followed up in Padgett²¹⁰ and DeWeese²¹¹ in particular. Pre-philosophical intuitions will be addressed in chapter six, where issues of epistemology and our perception of temporality come to the fore. We have already considered the historical tradition(s) in terms of the care needed to approach them and the methodological issues involved, as well as noting the depth of scholarship available for those wishing to pursue their views of divine eternity.

The final constraint that DeWeese discusses is headed ‘philosophical analysis’. Here he talks about logical rigour and coherence, and the drawing out of logical ramifications resulting from theological positions, as constraints upon the development of theology. I wish to build on this in two ways. First, I shall develop the content of this chapter to provide a more schematic consideration of constraints that science and philosophy can impose on theology. Second, in the next chapter, we shall see more detailed and specific consideration of how the philosophy of time constrains theologies of divine eternity. I am not generally in disagreement with DeWeese in either of these developments, save that I hold them to be just that: developing methodological comments into a more detailed structure, and providing further argumentation. It is my contention, after all, that this sort of thing ought to be engaged with as a vital part of constructing a defence of divine timelessness (and indeed, as far as methodology goes, for construction of almost any responsible view of God and time).

Moving on to lay out my proposed structure of constraints, then, I suggest three categories. One variety of constraint is semantic. If there are certain laws of nature and, for example, the concept of the ‘miraculous’ or ‘supernatural’ is defined by the theologian as an event going beyond the laws of nature, then attributing a divine action as ‘miracle’ is dependent upon knowing the laws of nature. Science can therefore constrain theology in terms of theology’s definitions and content with respect to itself. Further, to the extent that terms are shared between theology and philosophy or science, their referents as defined by philosophy and science constrain their reference in theology.

Another variety of constraint is factual and counterfactual constraint. An ESST could place a factual constraint on theology by explaining or providing an empirically predictive account of something upon which theology has been constructed. For example, a theological claim about creation and the place of humanity within it, which relied upon a Ptolemaic view of the universe with the earth at its centre, would be

²¹⁰ Padgett, *God, Eternity and the Nature of Time*, pp.23-37

²¹¹ DeWeese, *God and the Nature of Time*, pp.93-110

challenged by the Copernican revolution. Although this would be unlikely to ‘disprove’ a theology, nevertheless appeal could not be made to empirical fact in order to provide an analogy or metaphor for the theology, and since the theological truth-claim’s content may derive from a way of seeing the world, the challenge to the latter may result in the abandonment of the former.

Similarly, in areas such as the problem of evil, different (or new) issues may arise as a result of what an ESST tells us about causation, or the world, or human nature (*vis a vis* genetics). Constraints on theology would then arise in factual or counterfactual contexts. The idea of biological inheritance of original sin might be another good example of a way in which advances in science provide possibilities and constraints for theology.

Finally, there is a category of logical constraints. We are already used in philosophical theology to self-imposed logical constraints (regarding questions such as ‘can God make a stone too heavy for him to lift?’) where logical consistency places limits on what can be said theologically. These are generally seen as boundaries that help define where the real theological issues lie (after all, we are not really worried over whether God can make a stone too heavy for Him to lift; we are worried about what exactly the issues are in the topic of omnipotence).

I take the above not to be ‘news’ in the sense that it simply schematises approaches which have been considered fairly obvious by philosophers of religion, who naturally enough have had extended discussions on the topics I have used as examples, all of which are likely to illustrate the sorts of moves I am referring to far better and more exhaustively than I am able to here. Nevertheless, it is important to set the ideas out in the relevant structure to show the coherence of my approach.

The question in which I am primarily interested, however, is ‘can there be other logical constraints imposed on theology from outside of itself?’ Given the foregoing material, it seems plausible that there could be. For example, our theology of bodily resurrection must be affected by the philosophy of personal identity, which is in turn affected by physics and neuroscience. Clearly a theology of bodily resurrection which claims that all that is required for a person to be bodily resurrected is for God to reassemble their bodily parts would be seriously challenged by a scientific/philosophical demonstration that bodily integrity has nothing to do with constitutive personal identity over time²¹². Therefore there is a complex of philosophical arguments which are likely to be related to scientific material in the ways

²¹² Perhaps the defining criterion being memory instead, for example.

described by the structure I have adopted from Hawley. Similarly, it is also the case that in addition to the usual constraints we might expect to find in a philosophical theology of bodily resurrection (semantic, factual, logical²¹³) there may be specific constraints introduced into the process by the results of the philosophical/scientific interaction²¹⁴. What I am arguing for is that the nature of time is another such topic, introducing logical constraints on the theologies of divine eternity.

To take our exploration further, it could also be argued that there may be a parallel in theology to Hawley & Psillos' distinction between *ad hoc* and independently motivated theories. There does seem to be a difference between an auxiliary argument which gets around a problem and an alternative theory which has the theological equivalent of more explanatory power. For instance, the Bad Theodicy Club decides one week to compose a broadly Augustinian theodicy, predicated on the Fall as a strictly historical event. The critic responds that there is no evidence to suggest that the world was relevantly or significantly different before a certain point in time. The clever, but naturally bad, Club response is that being Fallen affects how we see everything, so pre-Fall geological/archaeological data would look the same as post-Fall data. A good (non-Club) response to the situation would be to give up the idea of a strictly historical Fall and construct a theology of the Fall in which it is a way of talking about human nature and moral fallibility; evil in the world can then be construed as resulting in various ways from the way in which every human being copes with having free will and so forth.

The reason, specific to our current purposes at least, for the awfulness of the first response is that the argument carries with it consequences for science and epistemology that far outweighs the gain to the theodicy. It essentially means that successful empirical systems and our trust in our own perceptual framework are faulty as ways of getting closer to 'the truth' about the structure of reality; in short, there is a danger of a radical scepticism creeping in. This makes the response *ad hoc* in a non-sensible way; the second response, by contrast, is independently motivated (by the desire to think about sin in terms of human nature, as opposed to terms of causal chains) and presents a genuinely different angle on the problem.

This argument is a more rigorous extension of one of DeWeese's constraints, which he terms 'greater explanatory power', saying that 'the best explanation will offer

²¹³ E.g.: what counts as resurrection? (semantic, logical); what is a body? (semantic, factual);

²¹⁴ For an example of the sort of starting point I envisage this structure helpfully working on, see Peter Geach's brief discussion of 'subtle bodies' at the beginning of his article. Peter Geach, 'What must be true of me if I survive my death?' in Brian Davies (ed.) *Philosophy of Religion A Guide and Anthology* (Oxford: OUP, 2000) p.724-725

more and/or better answers than its competitors.’²¹⁵ I take my position to be offering specific links to science and philosophy as part of characterising how we should judge the issue of greater explanatory power within the structure we have been discussing.

We can also endeavour to tie this in with the historical material we have already discussed. We have seen in Augustine, Boethius and Aquinas both differences but also overarching similarities. All to some extent deal with the dominant philosophies of their time in order to inform their theological reflection on God and time. Neoplatonism features pervasively, and the work of Aristotle may be considered not only a philosophical influence on Aquinas (and indeed Boethius) but also an embryonic scientific one – to the extent that the two can be distinguished at that historical distance – primarily through the influence of the Arabic interpreters to which Aquinas had access and their interests in the mathematics of infinity.

Reminding ourselves of some specifics, we can recall that for Augustine the concept of temporal succession (a preoccupation of Plotinian philosophy) and the exploration of the relation between the non-spatial and the non-temporal drove the development of his philosophical theology of eternity. For Boethius, the concern was epistemic, and the theology of eternity developed to solve problems with divine knowledge, but this development was constrained by philosophical structures. Boethius used Aristotle and Plato to help him distinguish between views which would be problematic for his theology and those which would not. Aquinas relies heavily on Aristotle to give him a philosophical structure for his theological work, and after using Aristotelian and Neoplatonic philosophy to think through change, cause and being, the logical consequences for time and eternity followed relatively straightforwardly.

Nevertheless, we see more direct theological work. All three ask questions which are motivated by primarily theological assumptions and for which theological answers are required. This is clearest where Augustine and Aquinas attempt to integrate scriptural elements, and of course Boethius’ motivation for discussing divine eternity is not a direct enquiry into the relation of God and time, but a response to the topic of omniscience and foreknowledge. We should bear in mind, however, that this work still operates under the sort of constraints that I have outlined, so that it would be difficult to argue that any elements of the authors’ theological work are ‘purely’ theological (in the way that one might attribute to, say, Karl Barth on the topic²¹⁶). These three historical figures, then, can fairly be taken as precursors of the more analytic tradition of

²¹⁵ DeWeese, *God and the Nature of Time*, p.7

²¹⁶ See, for example, Bent Flemming Nielson, ‘Karl Barth – A Brief Introduction: Time and Eternity’ available at <http://www.teol.ku.dk/ast/ansatte/Pdf-filer/timeandeternity.pdf> (accessed 27/07/07)

philosophical theology which demands at least minimum adherence to notions of coherence and consistency with which we are familiar from the heading of ‘logical constraints’ above. The overall picture, however, surely includes a deeper commitment, to the sort of constraints that I have argued shape our thinking at the present time.

How might we reconcile this with Mark Jordan’s comment that, for Aquinas, ‘a Christian theology done well ought to speak more and better things about matters of concern to philosophy than the philosophers themselves can say’²¹⁷? I would argue that this is not an exhortation to break free of the constraints I have suggested for theology, but a challenge to conceive of a deeper understanding of reality which is nevertheless scientifically and philosophically responsible. No-one should (or indeed would) suggest that theologians arguing for God’s existence should be ‘cut a little slack’ because, after all, they are only theologians. Similarly, a good argument owing its originality to a fresh angle of theological imagination should not be philosophically dismissed on that account. Presumably both Jordan and Aquinas would be content with both these points, and I see them as coherent with the structure of boundary and constraint that I have laid out above.

I hope that I have presented above some reasons to think that there is common ground between the discussion of science as a guide to metaphysics, and science and metaphysics as a guide to theology – at least, enough to see that although there are important differences we can and do think of science and philosophy as imposing constraints on our theological ideas. In order to make this even clearer for the case of the contemporary debate over divine eternity (for it is my contention that this is a case in which such constraints are most appropriate and effective), we shall now move on to a discussion of some of the basic ideas involved. The overarching concern here, however, is to establish a consensus regarding the way in which our theology of divine eternity can be, and often already is, constrained – a consensus which will allow us to explore in far greater depth the interplay of the ideas already considered.

²¹⁷ Mark D. Jordan, ‘Theology & Philosophy’, in *CCAq*, p.248

Chapter III – Philosophical Foundations: Constraints on Theories of Divine Eternity

Introduction

At the beginning of the previous chapter I canvassed the methodologies, with respect to the use of science in arguments of philosophy of time and religion, of several key scholars writing on God and time. My contention was that, although there were signs of some of them coming close, no-one had really detailed a rigorous groundwork that would help to clarify both their own (and others') use of science and under what auspices they would accept challenges to that use. Having tried to provide such a groundwork myself, and expanded it into a structure that would allow us to comprehend interactions of science, philosophy and theology more effectively, the time has come to ask what sort of constraints are formed specifically in the question of God's relation to time.

In line with the structure I have outlined, and for further critical reasons that will become readily apparent, the most straightforward way of doing this is in a 'nested' fashion: first, to ask what the philosophical constraints appear to be on theologies of eternity, and then to ask what reliance the philosophy has on scientific resources, so that a conclusion will show a flow of argument from the more specific science through the relevant philosophy to the effects in theological terms. Note that if we were to look at the science/philosophy interaction first, as might seem logical, we could not guarantee that all the ways that science affected philosophy would translate into ways that both of them affected theology – some issues in philosophy using scientific resources might not have any suitable theological application, and it would almost certainly exhaust the space available for a thesis.

Since the vast majority of contributors to the divine eternity debate have employed some philosophical principles, arguments or critical resources, it will not be helpful to look at 'methodological approaches' as we did at the beginning of the previous chapter regarding science – the material is simply too vast. However, we can focus in on a specific constraint issue that is of vital importance, insofar as it potentially represents a far more thorough constraint on arguments in the divine eternity debate. This issue centres on the question of whether the position we adopt in the philosophy of time is tied to specific views regarding God and time. What I wish to argue, following other works on the subject, is that there are such ties, indeed so much so that it may be

difficult or impossible to espouse one view of ‘God and time’ whilst supporting anything other than the correlated position in philosophy of time, and vice versa.

This chapter, therefore, will have the following structure: first, some necessary introductions to the philosophy of time and the terms of the debate will be provided. Second, I shall look at some key works (much as I did in the last chapter) to assess the increasing acceptance of correlations between philosophies of time and views of divine eternity. Third, I shall present a collection of arguments which claim that a proponent of (in general terms) a ‘tensed’ philosophy of time should also support (in general terms) a temporal God – and vice versa – whilst a proponent of divine timelessness should also support (in general terms) a ‘tenseless’ philosophy of time, and vice versa. This will leave me with one remaining task for this chapter: to explain what issues arise if the debate over divine eternity is reliant upon the debate in the philosophy of time, and to select which of these issues are most foundational to address for the defender of divine timelessness – in line with the purpose of this thesis.

The Terms of the Debate

The philosophy of time has managed to accrue a more than usually large number of terms for two sides of a debate, a situation which is saved from condemnation only by some subtle differences in tone which fit certain terms for some arguments better than others. The essence of the division is the concern over the importance of ‘the present’ in a description of the reality of time²¹⁸, a concern which is mostly broadened to include the concept of ‘tense’ generally (past, present and future). Consequently, the most prominent terms for theories of time are ‘tensed’ and ‘tenseless’. The former refers to theories which give ontological priority to concepts of past, present and future; the latter refuse priority to these concepts, holding that (whatever the case regarding anisotropy in the ‘direction’ of time) all moments of time taken as such are equally real. The caveat with these terms is generally that they can intermingle issues of semantics with issues of ontology: whether or not our language can (or should) be purged of tense or is essentially tenseless is only one question among many that have application to the debate.

²¹⁸ We are here restricting discussion by the premise that time is real, since most participants in the relevant debates accept this point. Consequently, proponents of the unreality of time (a not insignificant grouping spread over the last 300 years, with plenty of classical roots) will be set aside unless specific relevance pertains (e.g. McTaggart’s paradox).

The most neutral terms approximating the same distinction between ontologies of time are A- & B-theories – on the genesis of which, more shortly – although these have from time to time been considered unhelpful on the grounds that they fail to express anything about the views involved.²¹⁹ Padgett opts for the terminology of process & stasis, claiming that they are suitably descriptive and non-pejorative. DeWeese, following Michael Tooley²²⁰, chooses to employ ‘dynamic’ and ‘static’. Both of these pairs emphasise the arguments concerning ‘objective becoming’ versus the equality of reality across temporal extension.

A brief sketch of McTaggart’s argument²²¹ for the unreality of time will set the stage for many of the considerations in the wider debate, as well as explaining whence the terms ‘A-theory’ and ‘B-theory’ derive. The material can be summarised thus:

- (i) Temporal positions can be considered in a relation of past, present or future, where things are understood to be future, to become present and then to become past. This gives rise to a temporal series (A-series).
- (ii) Temporal positions can be considered in a relation of earlier or later, where things are understood to be before or after other things in time. This gives rise to a temporal series (B-series).
- (iii) We perceive events in time as an A-series.
- (iv) We can give an account of events in time (such as a history) as a B-series.
- (v) Time involves change.
- (vi) An A-series involves change because events change from being future to being present and then become past.
- (vii) A B-series does not involve change because it is true at any given moment that, e.g., event x is earlier than event y , regardless of our experience of x and y . Further it is true at any moment that, e.g., the light is on at t^1 and the light is off at t^2 .
- (viii) If the B-series is the fundamental description of time, then there is no change involved in the description of time. Therefore there is no time (from v and vii).
- (ix) If the A-series is the fundamental description of time then any event must successively have futurity, presentness and pastness. An event cannot have

²¹⁹ E.g. Padgett, ‘Eternity as Relative Timelessness’, in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.95

²²⁰ Michael Tooley, *Time, Tense, and Causation* (Oxford: Clarendon Press, 1997)

²²¹ J. M. E. McTaggart, ‘The Unreality of Time’, in Le Poidevin and MacBeath (eds.) *The Philosophy of Time* (Oxford: Oxford University Press, 1993) pp.23-34

more than one such determination (e.g. nothing can be both past and future), so one must appeal to the determinations being held in the past, present or future (e.g. in the future x will be present). These give rise to another set of inconsistencies (e.g. x being present and x being past are both in the future) which will require another order of tense determinations and so on to a vicious infinity. Therefore the fundamental description of time is contradictory, and so cannot describe time.

- (x) Time is not real, since on one description it is not time and the other description is not logically consistent. Our temporal descriptions of reality may be persistent, but they are not correct.

As a generalisation, A-theorists are those who would agree with McTaggart that an A-series (or the conception thereof) is the fundamental description of time, but disagree that it is contradictory. B-theorists would either agree that an A-series is contradictory and/or disagree that it is the fundamental description of time, and argue that a B-series (or the conception thereof) can provide a fundamental description of time.

Step (ix) in the above account is a brief version of McTaggart's Paradox. Although its nature and effectiveness is an area of discussion that continues to attract extensive attention,²²² the characterisation presented here is sufficient to show some points of importance. It is well worth noting is that the Paradox is often held to rely on a view of time in which past and future events have equal reality to present events (in short, on a view of time as a B-series in which all times have equal reality but in which the 'absolute window of the present' slides over them in sequence). Consequently the philosophical position of presentism is, in some form, held to provide a solution to McTaggart's Paradox by claiming that only the present exists: future events do not exist to come into being, and past events do not exist because they have ceased to be.

As one consequence of this evasion of the paradox, an event in reality only ever has one determination (presentness) because it does not exist as an event to have pastness or futurity – i.e. to say that something is past or future is to say that it was the case that x or that it will be the case that x , not to attribute any real possession of a determination or property. Presentism in philosophy of time might be considered

²²² For some recent work on this, see the special issue of the journal *Philosophical Writings*, 32 (2006) dedicated to this topic.

an ‘import’ from the debate over how things persist and the problem of temporary intrinsics. The question would be something like ‘how can the same thing have incompatible properties (e.g. be a cube at t^1 and a sphere at t^2)?’ The B-theoretician will frequently (but by no means always) tend to concentrate on the ‘at t^x ’ element of this and espouse a view of temporal parts or stages. The presentist on the other hand can claim that such a thing does not have incompatible properties; there is just one thing with its relevant property existing at any given moment²²³, and we should no more be worried about it having an incompatible property in the past than we should about it having an incompatible property in another possible world. Note that when these debates overlap one can find the term ‘presentism’ opposed by ‘eternalism’ as the B-theoretic view. That it does not automatically equate to that view in terms of use may be illustrated by arguments purporting to show that one should be a B-theorist if one is an eternalist²²⁴.

Trends in Contemporary Scholarship

What is the importance of concepts in philosophy of time for the theology of divine eternity? The task of this section and the next is to demonstrate that there should be mutual commitment between A-theories of time and divine temporality, and also between B-theories of time and divine atemporality. What have contemporary writers on time and eternity made of these links? There is a spectrum from those who have held that the theory of time we adhere to should not make much difference to our view of God and time, through scholars who have not made arguments in these terms but have come to accept the links when apprised of them, through to those who advocate them strongly.

An excellent example of someone who is aware of the argument that there should be strong links between philosophy of time and divine eternity, but who rejects the constraint of concomitance, is Brian Leftow. As part of his ‘working assumptions’, he provides the following explicit statement of his position:

This book does *not* assume that either a tensed or a tenseless view of time is correct. Some philosophers have argued that the claim that God is timeless is incompatible with

²²³ For more on this see, for example, Nathan Oaklander, *Temporal Relations and Temporal Becoming: A Defence of a Russellian Theory of Time* (Lanham MD. University Press of America, 1984)

²²⁴ E.g. Hales and Johnson, ‘Endurantism, Perdurantism and Special Relativity’ in *Philosophical Quarterly*, 53:213 (2003), pp. 527-539

a tensed view of time. I contend that they are wrong, but in asserting this I do not implicitly or explicitly endorse a tensed theory.²²⁵

Unfortunately, Leftow does not provide any references for the philosophers he mentions, so we do not know whom he has in mind here.

A good example of the middle-spectrum scholar is Paul Helm. Writing *Eternal God* in the mid-1980's, he makes plenty of references to the contemporary literature and arguments in philosophy of time: with the benefit of hindsight, one could read a commitment to a tenseless theory of time into many of his arguments. The first and perhaps strongest instance of this is when he says:

Even if an understanding of what is involved in individuals in time applying temporal indexicals to themselves is denied to God this may not matter very much because it has been plausibly argued that the use of such indexicals depends on there being a non-indexical concept of time for their proper employment.²²⁶

This point, early on in the work, is accompanied by a reference to Mellor's *Real Time*²²⁷. Nevertheless, an explicit (never mind methodological) linkage to tenseless theories of time being important *as such* to a defence of divine timelessness is absent. However by 2001, Helm's commitments seem clear: after using the concepts of A- and B-series time to explicate his idea of 'two standpoints'²²⁸ – a human standpoint in time and a divine standpoint outside time – he is pressed by his interlocutors to clarify his position, to which he replies:

Bill [Craig] is bothered...because he thinks that it may be inconsistent for a B-theorist such as myself to introduce such standpoints. But it is evident that it is perfectly consistent with the B-theory of time that agents employ temporal indexicals in their action on and reaction to their world. This represents and expresses their temporal standpoint. B-theorists proceed to affirm that this is not, ontologically speaking, the most basic standpoint, but nonetheless they recognize that the use of temporal indexical language is vital for the agency of someone who is in time.²²⁹

Again, in response to Craig's own contribution, Helm says that he would agree that efforts to combine divine timelessness and a temporal (tensed) creation are doomed, yet

For a consistent B-theorist this project need not be undertaken in the first place; indeed it ought to be studiously avoided. For such a person, God is really related to the

²²⁵ Leftow, *Time and Eternity*, p.18

²²⁶ Helm, *Eternal God* (Oxford: Oxford University Press, 1988), p.25

²²⁷ D. H. Mellor, *Real Time* (Cambridge: Cambridge University Press, 1981)

²²⁸ Helm, 'Divine Timeless Eternity', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.58-9

²²⁹ Helm, 'Divine Timeless Eternity', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.83-4

universe by virtue of freely creating and sustaining it. But God is not thereby rendered temporal.²³⁰

Thus, we can presume a strong commitment but must look elsewhere for more fully worked-out material on methods of relating philosophical theories of time to models of divine eternity.

Wolterstorff provides another example of contemporary scholarship along these lines. He is happy to assert that he is a tensed theorist and to present arguments making use of the relevant resources, but provides us with few claims or arguments about the reliance or otherwise of theologies of divine eternity upon tensed/tenseless theories of time, although he does follow a method of determining which view of time to support and then building arguments in the divine eternity debate using this²³¹. In this sense, methodologically (but without explicit discussion thereof) he is perhaps closer to the 'fully worked out' end of the methodological spectrum.

Padgett, Craig and DeWeese have all presented arguments of varying detail and extent for the importance of tensed and tenseless theories of time for the respective views of temporal and atemporal divinity. We shall see these contributing to the discussion in the next section, so they will not be rehearsed here and I shall restrict myself to some brief summary references.

Padgett expresses his position quite concisely in his article for *God and Time: Four Views*:

The main objection I have to the timeless model [of divine eternity] is simply stated: it is true only if the stasis theory of time is true. Since the stasis theory of time is false, we should reject the timeless view because we should, wherever possible, bring coherence to theology.²³²

Most of Padgett's efforts, therefore, tend to be concentrated on showing that a tensed/process theory of time and a timeless theology of eternity are incompatible, and secondarily on showing that a tensed/process view and a temporal theology of eternity are mutually supportive.

DeWeese's programme in his *God and the Nature of Time* is to arbitrate between philosophies of time, then to see if contemporary physics challenges the

²³⁰ Helm, 'Divine Timeless Eternity', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.161-2

²³¹ Nicholas Wolterstorff, 'God Everlasting' in Steven M. Cahn and David Shatz (eds.) *Contemporary Philosophy of Religion* (New York: OUP, 1982)

²³² Padgett, 'Eternity as Relative Timelessness', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.95; cf Chapter 4 of Padgett, *God, Eternity and the Nature of Time*, especially pp.62-81

philosophical view he approves, and then to use the results to work out what sort of theology of eternity to build. One key conclusion, however, is worth noting:

All atemporal conceptions of God's being must at least tacitly assume static time. ... My argument differs [from others] in that it does not rely on any conclusion drawn from God's knowledge. If my argument succeeds then I have shown that all atemporalist construals of God's being entail a B-theory of time.²³³

So, in short, not only are dynamic theories of time incompatible with divine timelessness, but the latter also ties one logically to tenseless theories.

Craig has produced by far the most on this topic, and has re-iterated the general importance of links between philosophical theories of time and theologies of divine eternity in several publications.²³⁴ His clearest pronouncements on this can be found in *God, Time and Eternity*, where he concludes the first part of the book by saying:

An adjudication of the doctrine of divine timelessness is therefore made feasible by – and probably necessitates – an adjudication of the tensed vs. tenseless theory of time. Few philosophers of religion have been willing to undertake seriously this task. But apart from such an assessment... the most important arguments for and against divine timelessness remain inconclusive. The adjudication of this debate within the philosophy of ... time is therefore of critical importance and cannot be avoided.²³⁵

His conclusion to the more limited argument in his article for *Questions of Time and Tense* is equally appropriate: 'theologians and philosophers of religion can advance the discussion of the nature of divine eternity only by tackling the... problem of the tensed versus tenseless theory of time.'²³⁶

However, Craig's theological concerns introduce a potentially problematic element into his structural approach. As a part of his avowedly 'philosophy of time centred' critique of the B-theory he has a short chapter presenting a 'theological objection' (from *creatio ex nihilo*) to the B-theory, and has the following to say about it:

Secular philosophers may find it odd or at least rather quaint to lodge theological objections against a particular theory of time. But Christian philosophers, such as the author, take such objections with utmost seriousness. A view which is philosophically coherent but theologically untenable cannot be true. It is entirely appropriate, therefore,

²³³ DeWeese, *God and the Nature of Time*, p.184

²³⁴ Craig, *God, Time and Eternity*; Craig, 'Timelessness and Omnitemporality', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, pp. 129-160; Craig 'The Tensed vs. Tenseless Theory of Time: A Watershed for the Concept of Divine Eternity' in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.221-250

²³⁵ Craig, *God, Time and Eternity*, p.137

²³⁶ Craig, 'The Tensed vs. Tenseless Theory of Time', in Le Poidevin (ed.), *Questions of Time and Tense*, p.248

to reflect on the theological implications of one's theory of time with a view to assessing its adequacy.²³⁷

From the viewpoint of my own methodological commitments I can hardly take issue with some of this if I expect to be consistent. Certainly, I should be equally committed to the fairness of lodging theological objections against philosophical positions, as a result of early comments in the thesis about theology speaking 'of more and better things', to use Jordan's phrase, than philosophy. But the primary thrust of my position is in favour of allowing theological premises as equal premises (to be challenged or supported) to secular philosophical premises. To say, then, as Craig does, that a philosophically coherent but theologically untenable position 'cannot be true' seems to be rather rash, since it smacks of unchallengeable premises rather than of defensible commitments. Certainly a philosophically coherent position might not be true (and theological resources might aid an argument for this) – but then a theologically coherent position might not be true either.

The real problem here, though, is a more specific one. As we have already seen, Craig makes a strong claim for the resolution of the divine eternity debate to be reliant on arbitration of the philosophy of time debate. One should be careful in such circumstances to avoid potential circularities, and the argument here appears to be something like this: A B-theory of time will, if correct, place constraints and demand certain interpretations of divine timelessness; one such demand that a B-theory of time makes is a certain interpretation of *creatio ex nihilo*. Therefore, that it makes such a demand, if true, is a good reason to think that it is incorrect. Yet purportedly the whole point of resolving the philosophy of time debate first is that it gives us an inkling of *the way the world is*: it is this way that the world is which constrains God's relation to it (after the fact, modally speaking, that God chose it to be the way it is). So my objection to Craig's tactic here is simply that, if he adhered to his methodology properly, he should not have placed the critical material where he has. Either the B-theory stands, and so one must find a way of reconciling it with one's creation theology – at which point such concerns come to the fore – or it does not stand and so one does not have to worry about reconciling it. We shall see in chapter five that Craig risks an even more blatant manoeuvre of this sort with regard to contemporary physics' input on the philosophical debate.

Tensed & tenseless views of time, temporal and atemporal views of eternity

²³⁷ Craig, *The Tenseless Theory of Time*, p.218

Having seen, in general terms, a concerted move in the contemporary debate towards recognising the importance of arbitrating philosophical theories of time as a precursor to developing theologies of eternity, we can move on to look at some detailed arguments. The overall approach fits with the methodological concerns of the thesis, in that science and philosophy are not determining theology as such but are placing boundaries and constraints. In particular, I am not trying to suggest in this section that no-one would find themselves preferring one view of divine eternity for strong theological reasons and a discordant philosophy of time for strong philosophical reasons; rather, I wish to show that in such a situation something will probably have to give – and to suggest that there may be reasons for preferring a particular philosophy of time that are strong enough to allow it to place powerful constraints on a theology of eternity, as opposed to ‘shopping’ for a philosophy of time that will agree with our theology without too much violence to our other philosophical commitments. I would see this in a similar light to comparable cases in which we allow views of causation, perception and logical limitation to constrain theology of divine action, omnipotence, omniscience and so forth (although in the case of eternity the potential constraint is much greater).

The strongest view we could arrive at would be:

Commit to A-theories ↔ commit to divine temporality

Commit to B-theories ↔ commit to divine atemporality

To avoid needless complexity and replication of arguments, I wish to concentrate on showing that we cannot really be B-theorists *and* divine temporalists, and neither can we really be A-theorists *and* divine atemporalists. As a part of this, arguments will become apparent in favour of being A-theorists and divine temporalists, or B-theorists and divine atemporalists, since in many cases the arguments do work in both directions. Looked at methodologically, what I am doing primarily is showing two inconsistencies, thereby providing two separate constraints on our philosophy of religion.

I shall begin with the more well-documented challenge: the inconsistency of holding a tensed view of time with an atemporal view of God. There are several arguments ranging from the more general to the more specific (the latter often in the form of criticisms of those who have attempted to combine the two positions).

DeWeese provides a general argument which he claims is free from one of the entanglements common to arguments in this area: involvement with divine omniscience. It runs as follows:

- 1) The ordered sequence of temporal events T exists in eternity in an atemporal analogue A of the temporal order.
- 2) There is a function $F(T,A)$ which maps points (moments, events) in the temporal order T onto points in the atemporal analogue A of the temporal order.
- 3) The future does not exist.
- 4) No function can map non-existent values onto real values.
- 5) $F(T,A)$ cannot map future points onto the atemporal analogue A .
- 6) Hence, A cannot contain atemporal analogues of future points of T .
- 7) Either A grows as the temporal order grows, or A is incomplete.
- 8) A cannot grow, since there can be no change in an atemporal entity.
- 9) A cannot be incomplete, for then the actual time sequence T would, at any time after the first event, be larger than A .
- 10) Therefore, if God is timeless then time is tenseless.²³⁸

This can also be considered a more specific argument angled at Leftow's model of eternity, since the first premise is intended to be a general distillation of Leftow's conception of eternity (and indeed Stump's and Kretzmann's, if A is taken as representation rather than genuine presence).²³⁹ By way of clarification: Leftow's conception of A is characterised by, for example, 'temporal events occur all at once in eternity, in addition to occurring at various points in time'²⁴⁰ understood as 'if all events really occur at once, they occur at once in an atemporal reference frame'.²⁴¹ Consequently, given Leftow's understanding of reference frames, A is not a shadow, replication or representation forming a separate reality, nor is it an atemporal representation of a single real sequence conceived (as we might, analogously) as a 'virtual reality overlay'; it is the same singular real sequence apprehended *and actually arranged/related* in a different way. At any rate, the first premise does most of the work, and the third premise helpfully includes most A -theories by placing emphasis on denying reality to the future.

²³⁸ DeWeese, *God and the Nature of Time*, p.181

²³⁹ DeWeese, *God and the Nature of Time*, p.181

²⁴⁰ Leftow, *Time and Eternity*, p.219

²⁴¹ Leftow, *Time and Eternity*, p.219

It might be thought that one could escape the force of the argument by mapping all possible points instead of just actual points. This would deny that (4) defines what it would be to map temporal points to an atemporal analogue, and (5) would only be true if we read ‘actual future points’ for ‘future points’. Consequently one might claim that, by containing all possible points, A and T by hypothesis timelessly contains the actual points which can be picked out as and when the temporal terms come about in T. The function $F(T,A)$ therefore maps a real temporal point to an atemporal analogue at any given moment, but this does not involve real change in A. However, this simply will not do: it replaces the problem of sequentially creating values in an atemporal analogue (essentially rendering it temporal) with the problem of sequentially picking out a value to be matched to another value. The fact remains that while (3) holds it demands that new relations come into being in real (not just logical) sequence; altering our conception of the atemporal analogue or of the mapping function, or of what is mapped, seems unlikely to provide any escape from this. DeWeese considers another way of getting around it – by using placeholders for each ordered pair where one term does not exist yet – but concludes that set theory would hold that the ‘before’ and ‘after’ sets would be non-identical because the reference would alter – from placeholder or concept to actual moment or event.

Padgett provides a less rigorous but more illustrative sketch of the same sort of point, using Nelson Pike’s definition of timelessness²⁴²:

The definition of something’s being timeless is (a) that it exists, (b) that it does not exist at any time and (c) that its existence has no extension in time. God can be all these things and still have to wait for a temporal world to pass by. What follows from God’s timelessness is that God never changes, but it does not mean that all times can be “present” to God. All times’ being present to God, while a traditional idea, is incoherent... What we might say is that God *coexists* with every moment in time.²⁴³

Such coexistence, it is argued, can only be reliant upon a B-theoretic ontology, since God cannot coexist with t^1 and then, t^1 having gone out of existence to be replaced by t^2 , coexist with t^2 and remain atemporal. Only a philosophical commitment to ontological equality for all moments of time at all moments of time will secure the basis for such coexistence.

There are three further interconnected arguments based on the premise that the changing present is an irreducible feature of reality. These may be summarised for ease

²⁴² Nelson Pike, *God and Timelessness* (London: Routledge & Kegan Paul, 1970), p.7

²⁴³ Padgett, ‘Eternity as Relative Timelessness’, in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.98

of reference as arguments from (i) divine knowledge (ii) divine belief and (iii) divine action²⁴⁴.

In the first case, the argument is that an atemporal being cannot know the contents of an irreducibly tensed world's temporal span because parts of that span do not exist at any given moment: to know that *x* exists and then that *y* exists, on this reading, involves the judgement that *x* exists *now* and a subsequent judgement that *y* exists *now*. The succession of judgments is enough to constitute temporality: consequently either God is temporal, or God can only judge that one of *x* & *y* exist, or God cannot judge that either of *x* and *y* exist.

DeWeese summarises this type of argument as follows:

- 1) Time is dynamic (that is, temporal becoming is real).
- 2) Hence what is real is constantly changing.
- 3) A timeless being cannot experience change in its knowledge.
- 4) Therefore, if God is timeless, he cannot know what is real.²⁴⁵

The swift response is that if we credit God with perfect foreknowledge, there is no material difference to be had and tensed time is still compatible with divine timelessness. However, this will not do: God might have full propositional knowledge but the issue at stake from the viewpoint of a tensed theory of time is 'knowing what there is now', where 'now' is vitally irreducible to anything else. This is not a sort of knowledge that the timeless God has access to with respect to a tensed world.

The second argument develops from a similar starting point of the features of tensed reality. The argument from divine belief, or intention, notes the necessity of tensed beliefs in such a reality; the above judgments of the existence of *x* and *y* are two such beliefs. An atemporal God would be unable to have such beliefs, since they must change as the contents of reality change, and it is incoherent for God simultaneously to believe all of (1) *x* is future (2) *x* is present and (3) *x* is past. Consequently, a timeless God cannot know when to act in a tensed reality, since God must intend to act *now*, or at least when the event of which God has propositional knowledge becomes present.

DeWeese provides a neat version of this:

²⁴⁴ For extensive discussion of arguments relating to divine action and knowledge in the context of tensed and tenseless theories of time, see respectively chapters 3 and 4 in Craig, *God, Time and Eternity*, pp.56-111 & pp.112-133

²⁴⁵ DeWeese, *God and the Nature of Time*, p.180

- 1) There are essentially tensed truths...
- 2) A timeless being cannot know essentially tensed propositions.
- 3) Therefore, if God is timeless, there are truths he cannot know.²⁴⁶

Ganssle²⁴⁷, as noted by DeWeese²⁴⁸, has attempted to circumvent this by using Alston's 'direct intuition' model of God's knowledge, which makes it non-propositional or non-discursive²⁴⁹. Although it may be effective against arguments employing the concept of tensed propositions, such as the one DeWeese suggests, the idea that direct intuitive knowledge is not a 'time-spanning relation' is probably not enough to secure the defender of divine atemporality against the problem of knowing what there is *now* as opposed to at some prior or subsequent moment, since at any given moment on a tensed theory at least the future (and possibly also the past) fail to exist at all.

We can continue this point into an argument about divine action, since on the same basis God must act on whatever is present. If what is present changes, then in order to act at two separate moments of time God must 'wait' between them: again, action followed by inaction followed by separate action is sufficient to constitute temporality. So again either God is temporal, or God can only perform one action, or God cannot perform either action.

The type of response employed against arguments from divine knowledge and belief – perfect foreknowledge and non-propositionality – is even less successful here: God cannot encompass all temporal actions in a single (non-propositionally known and planned) action because there is only ever one momentary reality extant to act upon. In order to make such an incorporation, God would have to 'encode' intended action within the first moment of temporal reality such that an action would occur after a certain amount of time had passed, or in response to certain states of affairs. This begins to look somewhat deistic, and therefore highly undesirable for a Judaeo-Christian model of divinity. As Padgett puts the point, with reference to the Boethian and Thomist analogy:

A picture of God ... seeing all of time at once, in the way an observer on a high hill can see the whole road at once. The problem here is that only one step of the road exists, even for the observer.²⁵⁰

²⁴⁶ DeWeese, *God and the Nature of Time*, p.180

²⁴⁷ Gregory E. Ganssle, 'Atemporality and the Mode of Divine Knowledge', *International Journal for the Philosophy of Religion* 34 (1993), pp.171-80

²⁴⁸ DeWeese, *God and the Nature of Time*, p.180

²⁴⁹ William Alston, 'Does God Have Beliefs?' in *Divine Nature and Human Language: Essays in Philosophical Theology* (Ithaca, NY: Cornell University Press, 1989)

²⁵⁰ Padgett, 'Eternity as Relative Timelessness', in *G&T:4V*, p.99

There are further arguments which are not so generic as these, but often rely on the same points, and revolve around criticisms of scholars who attempt to reconcile dynamic time with divine atemporality. The most notable set are critiques of Stump and Kretzmann's articles on eternity²⁵¹. I collate below a representative selection from Craig, DeWeese and Padgett.

DeWeese provides the most concise comments. Picking up on the third condition of their definition of ET-simultaneity ('an eternal entity or event observed as eternally present (or simply as eternal) by some temporal observer B is ET-simultaneous with every temporal entity or event'²⁵²), he argues that 'only a static theory of time could render this condition coherent.'²⁵³ Looking to clarify this criticism, he quotes Stump and Kretzmann's example of future events – as opposed to representations of them – being present to an eternal entity, as summarised by the claim that 'from the standpoint of eternity, every time is present, co-occurrent with the whole of infinite atemporal duration.'²⁵⁴ He compares this with their contention that 'it is not that the future pre-exists somehow, so that it can be inspected by an entity that is outside time'²⁵⁵ and concludes that confusion reigns. DeWeese objects that on a view of time as dynamic, future events do not exist to be simultaneous with anything, and one cannot simply define such a relationship into coherence. Stump and Kretzmann want to have it both ways, says DeWeese, and if they 'had simply bit [*sic*] the bullet and adopted a B-theory of time, then their definition would be more plausible.'²⁵⁶

Craig, in his own discussion of Stump and Kretzmann's earlier work, makes a similar argument, citing their definition:

For every x and for every y , x and y are ET-simultaneous iff

- (i) either x is eternal and y is temporal, or vice versa; and
- (ii) for some observer, A , in the unique eternal reference frame, x and y are both present – i.e., either x is eternally present and y is observed as temporally present, or vice versa; and

²⁵¹ Stump and Kretzmann, 'Eternity' *Journal of Philosophy* 78 (1981) pp.429-458; Eleonore Stump and Norman Kretzmann, 'Eternity, Awareness, and Action', *Faith and Philosophy* 9 (1992), pp.463-482; Eleonore Stump and Norman Kretzmann, 'Prophecy, Past Truth, and Eternity', *Philosophical Perspectives*, 5: *Philosophy of Religion* (1991), pp.395-424

²⁵² Stump and Kretzmann, 'Eternity', p.439

²⁵³ DeWeese, *God and the Nature of Time*, p.164

²⁵⁴ Stump and Kretzmann, 'Eternity', p.441

²⁵⁵ Stump and Kretzmann, 'Eternity', p.442

²⁵⁶ DeWeese, *God and the Nature of Time*, p.165

- (iii) for some observer, B , in one of the infinitely many temporal reference frames, x and y are both present – i.e. either x is observed as eternally present and y is temporally present, or vice versa.²⁵⁷

and concluding that, on the premise of dynamic time,

[g]iven that the eternal “present” is successively simultaneous with one temporal present at a time, eternity is not atemporal at all but has been temporalized in virtue of its real relation to time.²⁵⁸

Craig also argues that a later formulation of ET-simultaneity²⁵⁹ does no better. Here the definition eliminates the language of observation in favour of direct assertion of presentness in conditions (ii) and (iii):

- (ii) with respect to some A in the unique eternal reference frame, x and y are both present – i.e., (a) x is in the eternal present with respect to A , (b) y is in the temporal present, and (c) both x and y are situated with respect to A in such a way that A can enter into direct and immediate causal relations with each of them...
- (iii) with respect to some B in one of the infinitely many temporal reference frames, x and y are both present – i.e., (a) x is in the eternal present, (b) y is at the same time as B , and (c) both x and y are situated with respect to B in such a way that B can enter into direct and immediate causal relations with each of them.²⁶⁰

In an echo of his previous point, Craig explains that the situation this gives rise to simply sharpens the problem:

God’s being ET-simultaneous with only present events might appear... to be acceptable to the partisan of a tensed theory of time... One cannot, after all, be simultaneous with non-existent entities, so perhaps God’s being ET-simultaneous with present events alone is not so bad... But since which events are present is constantly changing, God acquires continually new relations of ET-simultaneity.²⁶¹

Engaging the same material from a slightly different angle, Padgett suggests that their misunderstanding of relativity theory has contributed to Stump and Kretzmann’s failure to see the crucial point. By taking relativity theory to claim that there is ‘no absolute state of being temporally simultaneous with’²⁶², they omit the key qualification

²⁵⁷ Stump and Kretzmann, ‘Eternity’, p.441

²⁵⁸ Craig, *God, Time and Eternity*, p.90; Craig, ‘The Tensed vs. Tenseless Theory of Time’, in Le Poidevin (ed.), *Questions of Time and Tense*, p.234

²⁵⁹ Stump and Kretzmann, ‘Eternity, Awareness, and Action’, p.477-8

²⁶⁰ Stump and Kretzmann, ‘Eternity, Awareness, and Action’, p.477-8

²⁶¹ Craig, *God, Time and Eternity*, p.95; Craig, ‘The Tensed vs. Tenseless Theory of Time’, in Le Poidevin (ed.), *Questions of Time and Tense*, p.238

²⁶² Stump and Kretzmann, ‘Eternity’, p.438

of absolute causal temporal orders within single frames of reference. Padgett's thought is, implicitly, that if they had not lost sight of this then they would have been less likely to attempt the reconciliation of dynamic time with divine timelessness, since absolute causal sequences more clearly raise the relevant question in line with a dynamic view of time: how can anything be simultaneous with something that is not yet real? Thus Padgett diagnoses Stump and Kretzmann's critical error in a similar fashion to DeWeese and Craig:

God cannot timelessly "will" that a certain effect take place at some future time, since the effects of his "will" do not yet exist. ... [G]iven their assumptions about time, God cannot both be timeless and sustain a changing temporal world.²⁶³

As part of an extensive critique of Leftow's view of eternity, Craig shows the severe strain Leftow's position is put under by his insistence on its being compatible with both tensed and tenseless views of time. He begins with what he regards as a core claim:

Relative to God, the whole span of temporal events is always actually there, all at once. Thus in God's frame of reference, the correct judgment of local simultaneity is that all events are simultaneous.²⁶⁴

Craig begins by clarifying that 'always' here must be taken as 'tenselessly' because God's frame is specifically timeless rather than sempiternal. On the same basis, 'simultaneous' must be taken to mean 'co-existent'. Craig then moves on to make sense of the language of local simultaneity judgments. He canvasses the option of the meaning 'all events exist in God's timeless frame of reference, but are tenselessly ordered by a "later than" relation such that no event occurs (tenselessly) later than any other'²⁶⁵ (i.e. ordered but ordered as simultaneous by way of being tenselessly co-existent). Craig is concerned that this equates to positing a single moment of time at which all events occur. What Leftow needs, however, is an ordering which is not a temporal ordering but an analogue of one.

In order to get a clearer picture, Craig turns to Leftow's criteria for distinguishing a temporal being from an eternal one in the eternal reference frame:

- a. its fourth-dimensional extension or duration would have parts.

²⁶³ Padgett, *God, Eternity and the Nature of Time*, p.73

²⁶⁴ Leftow, *Time and Eternity*, p.228

²⁶⁵ Craig, *God, Time and Eternity*, p.102

- b. not all parts of its duration would occur at the same temporal present
- c. its duration's parts would be ordered as earlier and later.
- d. In most cases, its duration would have a beginning and an end
- e. If it had no duration, still it would stand in a sequence representing the earlier-later relations obtaining between it and other events.²⁶⁶

Craig argues²⁶⁷ that this gives a clear impression of the temporal being in the eternal reference frame as a tenselessly existing four-dimensional world line (one might say that in the eternal reference frame, a temporal being appears to perdure). It means that the whole B-series of events is tenselessly present in the eternal reference frame – or, rather, that the set of B-series corresponding to the set of physical reference frames are tenselessly present.²⁶⁸ Appearances suggest, then, that Leftow should be committing to a B-theory view of time. Is there any way around this?

Returning to Leftow's use of relativity theory, in which B-relations of causally unconnected events vary with frame of reference, Craig posits that for Leftow the divine reference frame cannot have any of these relations (since they relate times), so that timeless co-existence is devoid of ordering relations. This includes not just temporal ordering relations but spatial ones as well. The latter can be seen by referring to Leftow's Zero Thesis ('The distance between God and every spatial creature is zero'²⁶⁹): Craig argues that, based on Leftow's belief that something located in one dimension of geometry is located in all, temporal things are spatial too; if something lacks temporal co-ordinates, it also lacks spatial ones. Although it might supply a way of maintaining all temporal content in an atemporal analogue, this worries Craig even more than the prospect of the 'ordered but simultaneous' interpretation, since he thinks it implies a God who is 'confronted with... a chaotic collection of points'²⁷⁰ with no ordering at all, although he admits that an omniscient God would know all the lines of simultaneity corresponding to all the physical frames of reference, and so even if events are intrinsically unordered in the eternal reference frame there is, as it were, an heuristic that God can apply to them.

The key difficulty, however, is that it still seems that Leftow's account demands a B-theory of time. All of the points in the atemporal analogue still seem to require the tenseless coexistence of the complete temporal series, and on an A-theory this is not

²⁶⁶ Leftow, *Time and Eternity*, p.237

²⁶⁷ Craig, *God, Time and Eternity*, p.104

²⁶⁸ Leftow, *Time and Eternity*, p.239

²⁶⁹ Leftow, *Time and Eternity*, p.222

²⁷⁰ Craig, *God, Time and Eternity*, p.103

possible (save perhaps at the end of time, if we manipulate arguments about the status of the past to provide the Tooley-esque view that reality increases with time). Indeed, Craig suggests that it would be much simpler to identify God's reference frame with the four-dimensional spacetime manifold²⁷¹, but cites Leftow's attempt to avoid this:

A defender of God's eternity can assert that (in a strictly limited sense) one and the same event is present and actual in eternity though it is not yet or no longer present or actual in time... That is, it can be true at a time t that an event dated at $t+1$ has not yet occurred in time, and yet also correct at t to say that that very event exists in eternity.²⁷²

Craig sees in this something suspiciously like a B-theory of time, and asks how Leftow can reconcile it with the reality of tense. The answer appears to be to relativise actuality to reference frames so that 'a temporal event's being present and actual in eternity does not entail that it is present and actual at any particular time in any temporal reference frame'²⁷³. The overall picture, then, is that in any temporal frame of reference it is correct to say that a given event is past, present or future, that it may have a different status in another temporal reference frame, and that it is present in the eternal reference frame. But, as Craig points out²⁷⁴, this really stretches the conceptual structure of reference frames, has a questionable grasp of the absolute sequencing of causally interconnected events that relativity theory contains, and still suggests the eternal reference frame to be best understood as the four-dimensional spacetime manifold (which is not itself a reference frame and which demands a B-theory of time).

All together, therefore, there are still plenty of problems which lead to the conclusion that Leftow would be better off as a dedicated B-theorist. Craig drives this point home in discussion of Leftow's view of omniscience, where he observes that Leftow's account of 'factual omniscience' seems to suggest that there are no tensed facts:

According to Leftow, a fact is either the existing of a subject or a subject's exemplifying of an attribute... the same fact that renders *It is then (i.e., at 3 P.M.) 3 P.M.* true also renders true what is expressed by the sentence token "It is now 3 P.M."²⁷⁵

Consequently God can be relevantly factually omniscient but these facts are not tensed, even if they make tensed beliefs true. It makes more sense to engage a tenseless theory

²⁷¹ Craig, *God, Time and Eternity*, p.105

²⁷² Leftow, *Time and Eternity*, p.232

²⁷³ Leftow, *Time and Eternity*, p.234

²⁷⁴ Craig, *God, Time and Eternity*, p.106

²⁷⁵ Craig, *God, Time and Eternity*, p.125

of time to expound this view than, as Leftow does, to attempt to secure knowledge of tensed facts for God.

DeWeese provides some less convoluted discussion of Leftow with a view to the same conclusion. He makes several criticisms: first, that Leftow takes 'now' as primitive and not entailing a position in a B-series (so that an eternal now is not temporal), whereas on an A-theory – especially, I would add, presentism – 'now' is either definitively temporal such that to be temporal is to be able to say of something that it is 'now', or considerable in terms of a separation of two other points, which could thereby place it within a B-series relation of earlier or later than. On a B-theory, things are in some ways worse because 'now' can be understood as picking out a time in a B-series or of referring to a simultaneity relation (e.g. 'simultaneous with my tokening this proposition').

DeWeese's second criticism extends the 'conceptual stretch' complaint from Craig:

How can very many – perhaps infinitely many – relativistic reference frames, each with its own clock, be represented in a single [eternal reference frame] in which there is no clock but merely an atemporal analogue of the ordering determined in each individual reference frame by B-determinations?²⁷⁶

DeWeese also objects that the atemporal analogue is not sufficiently clear, and the description of reference frames require extension along axes, so that the atemporal analogue of a B-series, without further elucidation, seems 'to do nothing more than to specify that within that reference frame some axis represents a B-series.'²⁷⁷ One implication we can draw, which DeWeese chooses to overlook in favour of a stronger criticism, is that it is hard to see a difference between this and a tenseless view – and we have already seen that there are problems in explicating this difference.

DeWeese's final objection moves from the sketchy conception of the atemporal analogue to concentrate on the extensional quality noted already. DeWeese argues that if there is an extension, there is something which has proper parts: Leftow's conception of divine eternity is vitally linked with his conception of divine simplicity (i.e. God's being must be equal to God's eternity), so Leftow is threatened with having to give up divine simplicity, since what is eternal – the atemporal analogue of B-series – will have proper parts. I am not convinced that this last line of attack will succeed against Leftow, since he has already quite happily said that everything is present in eternity, but

²⁷⁶ DeWeese, *God and the Nature of Time*, p.174

²⁷⁷ DeWeese, *God and the Nature of Time*, p.175

what is temporal is extended in time as well. If the atemporal analogue is the mode of things' presence in eternity, it does not seem straightforward that the atemporal analogue is what eternity *is*, or more cautiously what it is for God, so it does not necessarily follow that what God is has parts. By analogy one might argue that omniscience of diverse entities is necessarily knowledge of distinct things but that does not mean that omniscience itself has parts so that God has parts if God is God's omniscience. Nevertheless, this counter-argument gets Leftow no nearer to avoiding allegations of requiring a B-theory for his model of eternity.

We may also recall that DeWeese's general argument, which we saw earlier, was aimed primarily at Leftow's characterisation of eternity insofar as it employed the idea of an atemporal analogue. Having completed this loop of argument it should be clear that combining dynamic time and atemporal divinity is fraught with difficulty. What can be said about the prospect of B-theoretic time and a temporal God? There are three arguments, which will be considered in turn.

The first argument is related to the arguments from divine knowledge and belief that we have seen already. In his article 'History without the Flow of Time' Mellor says that 'on the tenseless view, there are no...changing facts: God can be in time without His knowledge ever needing to change.'²⁷⁸ Thus God knows all the (tenseless) facts and has no tensed beliefs. However, this is actually rather problematic. If God is in time, then God experiences temporal sequence in the form of the earlier, later and simultaneous relations that tenseless time requires. If God has no tensed beliefs, how can God know when to act? The most sensible suggestion is that God knows what is simultaneous with God's existence, and can therefore act at the appropriate moment. But this is no good at all: on a tenseless theory, and where God only knows the tenseless facts, it is the case that God exists at every moment of time (presumably this is one of the things God will know, *pace* Craig who thinks that such a God 'never knows at what moment He exists'²⁷⁹). So the idea of God in time on a tenseless view must mean something like 'God experiences moments sequentially, but knows both that He exists at every moment and the facts about every moment'. Unfortunately it is very difficult to see how this experience of temporality would be coherent, given that it differs from normal human experience in that (i) it contains knowledge of all tenseless facts and (ii) it contains no tensed beliefs about what it is experiencing. It seems that there is a risk of

²⁷⁸ D. H. Mellor, 'History without the Flow of Time', *Neue Zeitschrift für systematische Theologie und Religionsphilosophie* 28 (1986), p.75

²⁷⁹ Craig, *God, Time and Eternity*, p.137

the position collapsing either into the ‘tensed plus temporal’ view or the ‘tenseless plus atemporal’ view, and it is unclear what could motivate one to fight either of these off.

If we were to countenance God having tensed beliefs, it might be easier to make sense of a temporal God in a tenseless time. This option is pursued by MacBeath²⁸⁰ but heavily criticised by Craig²⁸¹, who argues that a God who has tensed beliefs in a tenseless universe certainly facilitates knowledge in the ways one might expect, but does not actually experience the truth about reality, since tensed beliefs under such conditions do not correspond to tensed facts but tenseless ones. How is this compatible with God’s perfection as knower? By contrast, a temporal God in tensed time requires tensed beliefs to make sense of tensed facts; God’s knowledge is perfected by such beliefs.

The second argument is an analogue from the first to the area of divine action. On a tenseless theory of time where God is temporal, either God’s actions must be multiple and successive, or singular and stretched out through time. The latter is possible because God knows all the facts of the complete time series on a tenseless view of time; consequently, even if God is located at one moment of that time series (or simultaneous with it in God’s own time), it is possible to act, or to intend to act, on any given moment. However, once again this raises questions of how God is relevantly in time, and if we are obliged to retreat to talk of God’s sequential experiences it again raises the question of whether God must wait to act and react. This would feed into the case where God’s actions are multiple and successive, but then it is unclear what advantage has been gained over the tensed theory in which God must wait to act. A collapse into either a temporal God in a tensed time or an atemporal God outside a tenseless time seems still to be a risk.

The final argument against a temporal God in a tenseless time is that it threatens divine simplicity insofar as it invites a view of temporal parts. More carefully: if all moments of time are equally real and God exists at all moments of time, then it seems plausible that God acts in different ways at different times and has different relations to things at different times. On a presentist view of a temporal God this would be explicable as a simple entity changing over time, but at any one moment – that being all that exists – God is as God is. However, on a tenseless view, God is x -at- t^1 and y -at- t^2 and, given that both times are equally real, how can we avoid the conclusion that God

²⁸⁰ Murray MacBeath, ‘Omniscience and Eternity I’, *Aristotelian Society Supplementary Volume* 63 (1989), p.55-73

²⁸¹ Craig, *God, Time and Eternity*, p.137

has parts? Of course, giving up divine simplicity may not worry someone who has already given up divine atemporality, and probably immutability.

As a means of rounding this section of the chapter off, Padgett provides a nice summary of the basic contentions that we have been discussing:

1. On the timeless view, God cannot have any real change. This follows from the very idea of a timeless being.
 2. Since God sustains all things, God is responsibly directly for the being of all things, at all times.
 3. On the process theory of time, things come into and pass out of existence with the passage of time.
 4. On the stasis theory of time, nothing that ever has existed or will exist passes out of existence from a timeless perspective. God creates/sustains the universe “tenselessly” or timelessly.
 5. On the process theory, bringing something into existence, or ceasing to sustain something, is a real change in the Creator, not the creature.
- A. On the process theory of time, God undergoes real change (from [2], [3] and [5]).
 - B. Only the stasis theory of time is compatible with (1) (from [2] and [4]).²⁸²

The two dual commitments that have taken shape in this section indicate the importance of identifying important issues in the arbitration of philosophies of time as a means of securing constraints on the theology of divine eternity and I shall return to some of the considerations here in the final chapter of the thesis, where I hope to emphasise both how much work they can do in theological argument about divine eternity, and some important exceptions. Before moving on to select areas of philosophical debate, however, a note is required on why we should, or should not, turn to historical material to find a more extensive account of how philosophies of time and theologies of eternity relate.

In his historical reflections on divine timelessness, Padgett briskly comments that ‘It was not until the 13th century that the traditional doctrine of eternity was questioned’²⁸³ by way of introducing his discussion of Duns Scotus, and although extended discussion of his work is not possible here, the angle Padgett takes on it provides a chance to recollect certain elements of the first chapter of this thesis in order

²⁸² Padgett, ‘Eternity as Relative Timelessness’, in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.97; cf chapter 4 of Padgett, *God, Eternity and the Nature of Time*

²⁸³ Padgett, *God, Eternity and the Nature of Time*, p.51

to feed them into our discussion of the links between philosophical and theological positions in this chapter. Padgett attends to two arguments by Scotus. The first responds to the Thomistic analogy of God as the centre of a circle, the circumference of which represents time. Whereas for Thomas the circle is ready-drawn, Scotus takes a different line, arguing that time is really like a point moving about the circumference (i.e. the relationship between God and time is like a radial line). Thus ‘time is not a standing circumference, but a flowing one, of which circumference there is nothing except the actual instant’²⁸⁴.

The second argument moves from the premise that what is present is actual, and that under the Thomistic view the future is likewise actual in eternity. This means that what is future now is already actual, so that God cannot act so as to create new things when the future becomes present. But at least some future things will be entirely new, so we must change our view of eternity.

Padgett makes the following move from this evidence:

In both of these arguments Scotus assumed the process theory of time. Given this view of time, he argued that since the distinction between past, present and future is a real one, then it is real for God.²⁸⁵

Although this is clearly not an example of someone adhering to ‘a philosophy of time’ as such, it is clear that Scotus has a strong opinion on the nature of time and is using it to challenge the philosophical foundations of what would have been a theological commonplace, and Padgett is right to identify it as such. One can therefore suggest, much as I did in chapter one, that there are noticeable historical roots to the practice of matching one’s philosophical intuitions about time with one’s views on divine eternity (whether explicitly or not), and that this encompasses more than simply the tradition represented by Aquinas *et al.*

There are various extended discussions of which philosophies of time are adhered to by which historical figures²⁸⁶, but I do not propose to engage in this sort of exposition for three reasons: first, because they are sometimes maltreated as springboards for developing a theology of eternity, which opens modern authors to a certain amount of partiality or wishful thinking in interpretation which would take a thesis in itself to disentangle through careful historical scholarship (the resources for

²⁸⁴ Scotus, *Ordinatio*, I, d. 39, q.5, sec. 35, cited Padgett, *God, Eternity and the Nature of Time*, p.51

²⁸⁵ Padgett, *God, Eternity and the Nature of Time*, p.51

²⁸⁶ See Leftow, *Time and Eternity*, chapters 4, 5 and 6; DeWeese, *God and the Nature of Time*, chapters 5 and 7; Padgett, *God, Eternity, and the Nature of Time*, chapter 3.

which are already provided for²⁸⁷). Second, I have already set out what I take to be the most important methodological issues involved so that further detailed historical study would be otiose. Finally, I suggest that the historical theology already explored is sufficient for the defender of divine timelessness to see much of the philosophical material relevant to that defence in its historical context, and adequate to illustrate the care which should be employed in investigating philosophical milieus that are relatively alien to our contemporary structures of thought. Historical study, then, may be fruitful for the proponent of divine timelessness, but is not essential to the core concerns as addressed by this thesis. This leads naturally to the question of what should be addressed.

Selection of Key Issues

In the final part of this chapter the task is to determine which issues are most important for the defender of divine timelessness to address. To prevent arbitrary selections, there are criteria formed by the methodological concerns of the thesis. We should be interested in:

- 1) Arguments which make explicit reference to science – it is likely that analysis of these in terms of the methodology laid out already would be fruitfully pursued.
- 2) Arguments which would be held to constitute overwhelming philosophical evidence in favour of a position regardless of what scientific material has to say on the topic – it is likely that these will provide critical resources for the strategies of Undermining and Counterargument, complementing any scientific material.
- 3) Arguments which centre on candidates for ‘philosophical foundations’ of either A- or B-theories, and which would potentially be commuted through the structure of constraints to philosophical foundations of divine timelessness or temporality.

I would argue that the status of the present as metaphysically/ontologically favoured is the best starting point for selection of relevant issues. What can be appended to the above criteria to support this contention? It seems clear from the

²⁸⁷ Richard Sorabji, *Time, Creation and the Continuum: Theories in Antiquity and the Early Middle Ages* (Chicago: University of Chicago Press, 2nd ed 2006)

foregoing material in this chapter that the more powerfully the present is emphasised the more likely it is that one will be constrained to exploration of a broadly temporalist view of God. One could imagine a philosophy of time in which all moments were considered of equal reality (as a B-theory might propose) but where the importance of the present and temporal becoming were urged through (i) the importance of tensed beliefs (ii) the need for a robust account of change and (iii) the idea that humans have a sense of being 'in time'. Now it seems to me (albeit primarily in virtue of the way that I have expressed the points) that this might provide fewer constraints on the defender of divine timelessness; indeed, with a bit of effort one might accommodate these points within a B-theory of time.

However, if we replace these with points ontologically emphasising the present, we might obtain: (i) the truth of tensed beliefs, as relating events to the present, (ii) the need for an account of a changing present, and (iii) the fact that all that we experience, we experience as present. These are a lot tougher to deal with. Based on the arguments in the previous section of this chapter, they may even rule out divine timelessness if developed strongly enough. If constraints favouring divine temporality come from the emphasis of the present in A-theories of time, then the philosophical foundations of a defence of divine timelessness are liable to come from the denial of the ontological importance of the present; such a move will strengthen B-theories and weaken A-theories.

As we saw towards the beginning of the chapter, McTaggart's arguments purported to show the unreality of time and have been employed by A-theorists to affirm dynamic time (by using McTaggart's claim that the B-series relies on the A-series) and by B-theorists to deny dynamic time through McTaggart's paradox. Do we need to look more closely at this issue? I think not: we also saw that presentism allegedly provides a way of escaping the paradox, by arguing that the present is all that exists and denying that an event can therefore have incompatible properties of pastness, presentness and futurity, since there exists no event or entity to which pastness or futurity can be simply applied. Presentism seems likely to represent the end of the A-theoretical spectrum which most threatens divine timelessness, so concentrating on defeating A-theories through an argument which, if it works against anything, works against non-presentist metaphysics, will not cut the mustard.

Whether or not it is possible to avoid McTaggart's paradox in other cases, it is generally accepted that presentism is an effective way out, the problem then being one

of whether presentism is a good idea *per se*²⁸⁸. Moreover, Craig himself argues that all A-theoretic approaches fall prey to some version of McTaggart's paradox except for presentism – even, for example, Michael Tooley's causal theory which Craig describes as a 'reality accretion' model²⁸⁹. If this is so, the use of a version of McTaggart's paradox must be logically subsequent to the defeat of presentism even if it is a vital move in affirming the strength of B-theories of time.

Things are moving into focus: denial of the ontological importance of the present and a critique of presentism go hand in hand, so that the next step must be to identify arguments in support of presentism which also conform to our criteria of selection. Fortunately there is a clutch of arguments which provide exactly what is required, and which fit very neatly into the structure provided by Hawley's work.

A closely connected area of debate concerns the relation between language and ontology. Craig's summary of the (pro-A-theory) case, as he sees it, is as follows:

Tensed sentences, which can neither be translated into synonymous tenseless sentences nor be given tenseless, token-reflexive truth conditions, correspond, if true, to tensed facts.²⁹⁰

Various scholarship has attempted to argue that tensed sentences *can* either be translated into synonymous tenseless sentences or be given tenseless, token-reflexive truth conditions. More recently, D. H. Mellor has provided an account which accepts the importance of tensed beliefs but argues that all that is required are tenseless *facts* – i.e. tenseless truth-makers for those beliefs. If successful, these attempts go a long way to showing that tense is not an irreducible element of reality, even if it is practically a ubiquitous element in our communication about that reality.

There are also characteristics of presentism that give rise to critiques that can fit together with the concerns in this debate. Le Poidevin summarises them thus²⁹¹:

1. The extension of the existential quantifier is restricted to presently existing objects.

²⁸⁸ Cf Robin Le Poidevin, 'The Debate About Tense', in Robin Le Poidevin (ed.), *Questions of Time and Tense*, p.38

²⁸⁹ See Craig, *The Tensed Theory of Time*, p.215, especially n.143.

²⁹⁰ Craig, *God, Time and Eternity*, p.138

²⁹¹ Note that this primarily characterises A. N. Prior's presentism, but it is important to work with this characterisation for two reasons: first, because it suitably describes many of the features of the metaphysical position I am analysing. Second, because Craig attempts to defend his view from the critiques that arise from *this* characterisation, since he wishes to adopt a version of that metaphysical position. Other versions of presentism are available, for example Quentin Smith,, *Language and Time* (Oxford: Oxford University Press, 1993) or Craig Bourne, *A Future for Presentism* (Oxford: Oxford University Press, 2006)

2. Relations obtain only between contemporaries, that is, objects existing at the same time.
3. Past and future tenses are to be interpreted as sentential operators on core present-tense sentences, the present tense not requiring representation by an operator.
4. Instants are logical constructions out of propositions.
5. Past- and future-tense statements have only present facts as their truth conditions, that is, what makes a certain statement about the past or future true is the evidence that at present exists.²⁹²

Although the literature is extensive, it seems likely that considering recent versions of arguments concerning truth-makers and truth-conditions, and any necessary associated issues, might be useful. In particular, the presentist sides of these debates may constitute the sort of independent arguments that can outweigh scientific involvement in arbitrating the metaphysical dispute (i.e. are candidates for Counterargument employment), and if they do not it may transpire that they can provide independent arguments in the event that a scientifically level playing field can be obtained (i.e. are candidates for Undermining employment). Success by the critic of presentism in this area will uncover likely philosophical foundations for a defence of divine timelessness.

Turning to scientific issues, it is clear that the debate over whether relativity theory can act as a guide to the metaphysics of time is a key one. The main argument is that the relativity of simultaneity across frames of reference described by the special theory of relativity indicates that there is no such thing as an absolute present; several moments of time may be considered equally real. An A-theorist who is willing to accept the reality of the future and the past but argues that the present is an ontologically favoured determination shifting through events *may* cope with this by relativising presentness to reference frames²⁹³. The presentist, however, seemingly cannot maintain presentism except by claiming that existence is relative to reference frames. Consequently those who support a B-theory of time claim support for their own position, which they suggest is eminently compatible with the science, and presentists generally attempt some form of scientific revision to find a version of relativity theory that is compatible with their position.

²⁹² Le Poidevin, *Change, Cause, and Contradiction*, p.36

²⁹³ See Storrs McCall and E. J. Lowe '3D/4D Equivalence, the Twins Paradox, and Absolute Time', *Analysis* 63:278 (2003), pp.114-123

All these considerations are highly pertinent and play directly into the methodological concerns of the thesis²⁹⁴. I suggest that pursuing a revision of science amounts to a strategy of Undermining; if this is not viable, then powerful philosophical arguments will be needed to pursue Counterargument in the face of a potential claim for scientific support from the B-theorist. Success by the critic of presentist metaphysics in this area is likely to provide further philosophical foundations for the defender of divine timelessness.

Craig offers an argument that attempts to extend the more usual epistemic notion that objective tensed reality is the best explanation of our experiences of the world (which places the burden on the B-theorist to show some way in which we are mistaken). His idea is that belief in tense is properly basic and not able to be rebutted or undercut by other considerations. Indeed, he claims that belief in the reality of tense enjoys so much warrant in our noetic structure that it trumps any potential argument that is put forward to defeat it: ‘tensed beliefs are so strongly held that no one can successfully divest himself of them and... their abandonment would generate repercussions throughout one’s entire noetic structure.’²⁹⁵ Craig goes as far as to argue that if belief in tensed reality is properly basic for everyone then B-theorists, to the extent that they reject the belief, are irrational. The strength of this claim is reminiscent of Hawley’s identification of the Counterargument strategy that accepts scientific support for a metaphysic but claims that independent philosophical considerations directly outweigh it. Thus, much as for the linguistic and truth-maker arguments, it is apparent that this epistemic discussion should be followed up and placed within the methodical structure of this thesis. Failure by the critic of presentism to avert the force of such an argument may have serious repercussions, for if we are irrational to reject the present *as a favoured ontological category as well* (in just the way the presentist suggests it to be), the importance thereby allocated to the present may end up ruling out divine atemporality as a possibility.

There is a further complex of arguments concerned with how to give an account of objective temporal becoming, if one is an A-theorist, or of how becoming could be mind-dependent or otherwise reliant upon consciousness in its interaction with reality, if one is a B-theorist. Some of these issues relate to the logical notion of the present and

²⁹⁴ To the extent that, as we saw at the beginning of the chapter, there is some overlap with the issue of persistence and temporary intrinsics, that debate is also pertinent. However, many of the arguments fielded against presentism and in favour of some sort of perdurance are similar or identical to the science-based material in the philosophy of time, and there is sufficient separation of interests not to oblige us to go too deeply into that debate itself.

²⁹⁵ Craig, *The Tensed Theory of Time*, p.165

can be incorporated under considerations of truth-makers and whether reality is tensed. Others are more phenomenological: for instance, what does it mean to say that we experience time passing?²⁹⁶ Others still dip into related issues in the philosophy of mind: what does it mean to assert that temporal becoming is mind-dependent; how should we understand mental events?²⁹⁷ These points I would argue to be mostly derivative from more fundamental issues, at least for the purpose of this thesis. Direct arguments about the nature of time and how we can know it, one might say, give us a picture of what time is. It is a secondary process to make sense of this in terms of our status as conscious entities (and it is not as if epistemology, science and language are devoid of considerations of our experience of time – we shall see a limited argument concerning the mind-dependence of presentness in the epistemological discussion of chapter six). We must maintain our focus on the status of the present, in the anticipation that it will pay dividends.

In summary, the next few chapters must address the question of the metaphysics of the present, as incorporated into the methodological structure of the thesis, in order to derive suitable principles, points, or premises, which can contribute to the philosophical foundations of a defence of divine timelessness that this thesis seeks to elucidate.

We remind ourselves that the levelling of the scientific playing field is the main step of Undermining in Hawley's schema; this forms the centrepiece of the discussion (chapter five). The independent arguments concerning language and ontology may provide resources for Counterargument, but if not may well form a natural match with the scientific material to complete the Undermining strategy; their flexibility makes them worth laying out as soon as possible; I do so in chapter four. The epistemological arguments, regarding the overwhelming impingement of the present into our noetic structure, are more directly suited to Counterargument, and form a strong 'final line of defence' should other arguments fail; they are therefore placed in chapter six. The next three chapters, then, provide an in-depth analysis of the strategic possibilities for Undermining and Counterargument which the presentist might employ to promote their 'alternate metaphysics'. We should, by the end of this process, be able to see more clearly the issues of science and metaphysics' interaction nested within a wider metaphysical debate, which is in turn set in the widest context of constraints on the theology of eternity.

²⁹⁶ See Craig, *The Tensed Theory of Time*, pp.218-258 for discussion and select bibliography

²⁹⁷ See Craig, *The Tenseless Theory of Time*, pp.167-177 & pp.127-145 for discussion and select bibliography

Chapter IV – The Status of the Present: Language, Facts and Ontology

Introduction

Craig provides extensive discussion of the recent history of attempts to resolve the debate in the philosophy of time by recourse to considerations of language. However, his position is that

Tensed sentences ostensibly ascribe ontological tenses [and] unless tensed sentences are shown to be reducible without loss of meaning to tenseless sentences or ontological tense is shown to be superfluous to human thought and action, the ostensible ascription of ontological tenses by tensed sentences ought to be accepted as veridical.²⁹⁸

That this potentially plays things a little fast and loose is clear when it is compared with DeWeese's careful preparation for his own more limited discussion of language. He considers a 'syntactic priority thesis' and a 'semantic priority thesis' and finds them both lacking. Regarding the former, he cites Russell's exhortation to be able to 'infer properties of the world from properties of language'²⁹⁹ and argues, with Andrew Newman, that 'ordinary language admits of different, mutually exclusive interpretations, and the decision among interpretations will have nothing to do with language and everything to do with metaphysics.'³⁰⁰ Likewise, he argues, the idea that the meaning of words outside of their context will allow us to draw conclusions about the structure of reality without broader metaphysical considerations coming into the picture, seems doomed to failure. For DeWeese, the best we can do is a 'weak' argument from common linguistic practice, which he summarises as follows: 'One role of language is to make it possible to refer to objective reality'³⁰¹ allowing the argument

1. Common linguistic practice provides prima facie evidence of the nature of objective reality.
2. Common linguistic practice is irreducibly tensed.
 - a. Attempts to translate tensed into tenseless language are unsuccessful.
 - b. Attempts to give tenseless truth conditions for tensed statements fail to convey significant information contained in the tensed statement.

²⁹⁸ Craig, *Tensed Theory*, p.22

²⁹⁹ DeWeese, *God and the Nature of Time*, p.22 citing Russell, *An Inquiry into Meaning and Truth* (London: George Allen and Unwin, 1940), chapter 25

³⁰⁰ DeWeese, *God and the Nature of Time*, p.23 cf Andrew Newman, *The Physical Basis of Predication* (Cambridge: Cambridge University Press, 1992), p.36

³⁰¹ DeWeese, *God and the Nature of Time*, p.23

3. Therefore, irreducibly tensed common linguistic practice provides prima facie evidence that objective reality itself is tensed (i.e. that time is dynamic).³⁰²

Although the form of the argument is almost identical to Craig's own approach, DeWeese's conclusion is expressed in terms of prima facie evidence³⁰³, whereas Craig's conclusion is more stark: 'Therefore, tensed sentences' ostensible ascription of ontological tenses to events/things is veridical. Reality is tensed.'³⁰⁴

Tenseless Facts as Truth Makers

In line with the overarching concern of this thesis to provide focal points for the defender of divine timelessness rather than an exhaustive treatment of the philosophy of time that could have a bearing on divine eternity, I choose not to become embroiled in either the old B-theory of language which argues for tenseless translation of tensed propositions, or the new B-theory of language which argues for tenseless truth conditions of tensed propositions. Rather, taking on Le Poidevin's concern³⁰⁵ that the debate over truth-conditions may have eclipsed some crucial ontological issues, I propose to restrict discussion to some arguments which have most relevance to the ontology of time and to the thesis as a whole. I shall begin with Mellor's position as regards tensed and tenseless language's truthmakers, and Craig's response to it. This will provide a way in to the exploration of some arguments against presentism which centre around truthmakers, and the analysis of Craig's model of presentism, which, he suggests, evades the criticisms levelled at presentism. The greater part of the chapter, then, is about the 'language and ontology' of time in the sense that it is about its logical coherence and not about its epistemology or relation to empirical science, which we shall consider in later chapters.

Moving straight to (and through) Mellor's *Real Time II* analysis allows the tenseless theorist potentially to concede two points without becoming bogged down in detailed debate or conceding the ontologically vital elements of their position (*viz.* that all times are equally real). The two points conceded are, first, that it is no good trying to provide tenseless translations for tensed propositions as a way of 'forcing' tense out of reality, and, second, that tensed beliefs/propositions are an ineliminable part of our

³⁰² DeWeese, *God and the Nature of Time*, p.21

³⁰³ DeWeese, *God and the Nature of Time*, p.29

³⁰⁴ Craig, *The Tensed Theory of Time*, p.130

³⁰⁵ Robin Le Poidevin, 'The Past, Present, and Future of the Debate About Tense', in Robin Le Poidevin (ed.), *Questions of Time and Tense*, p.37



interaction with the world, perhaps to the extent that we cannot provide tenseless truth conditions for every tensed proposition. The core of the remaining option that Mellor espouses is this: that there are facts that make propositions true (regardless of whether those propositions are tensed or tenseless) and these facts are not tensed facts but tenseless ones. In short, they are facts about things, people, beliefs, events and tokens, *at times*.

The construction of Mellor's argument begins with concepts of 'A-facts' and 'B-facts'; the former employ A-terminology, whilst the latter 'are contingent facts about how much earlier or later events are then each other, and hence about what their B-times are; none of which ... entail any A-facts.'³⁰⁶ Mellor then sets out to show that tenseless surrogates can be found for tensed facts, and that, further, B-facts are all that are needed *ontologically*. A-facts, then, if Mellor is successful, will be relegated to the status of things that we have built onto a B-reality to help us to understand it.

Mellor's second step is to accept that there can be true tensed beliefs and that their truth-values vary depending upon when they are held. He uses the following example: 'suppose that today is 1 June, the day before my friend Jim's big race. My present future-belief that Jim will race tomorrow differs in type from the future now-belief, that he races today, which I expect to have tomorrow, even if both beliefs are made true by the same fact.'³⁰⁷

Mellor observes that there are two contenders for the truth-making fact: a 'presently existing A-fact' (Jim races tomorrow) and a B-fact (Jim races on 2 June). Before prosecuting his case, he interjects a discussion of truth-bearers. Mellor argues that it does not really matter what the truth bearers are, because his argument turns on 'what *makes* them true when they are true.'³⁰⁸ As Craig points out (with some chagrin, having spent circa seventy pages discussing the matter in one form or another) 'the question of truth-bearers is critical. For statements and sentences cannot solve the problems which brought down the New B-Theory of Language, since they do not exist at all times, nor can linguistic meaning do the job, since meanings are neither true nor false.'³⁰⁹ Nevertheless, it seems reasonable to Craig (and to me) that Mellor is employing sentence types (as opposed to tokens) as truth bearers in his final analysis. However, in charting the development of Mellor's position, it will appear from time to time over the next four pages that he takes tokens to be truth bearers; there will be

³⁰⁶ Mellor, *Real Time II*, p.19

³⁰⁷ Mellor, *Real Time II*, p.23

³⁰⁸ Mellor, *Real Time II*, p.24

³⁰⁹ Craig, *The Tensed Theory of Time*, p.93

plenty of more complex issues to resolve without regularly bringing this up, and so (to enable the reader to concentrate on those issues) we can note in advance that the final form of Mellor's argument will address this point by making the sentence types truth-bearers.³¹⁰

Mellor also differentiates a weak and strong sense of 'fact', the strong sense which he desires to use being a 'truthmaker' sense of fact such that "Jim races tomorrow" is *made true* by a fact P.³¹¹ This is over and against the weak sense, where – following Tarski – 'x' if and only if x (so the weak sense would be 'Jim races tomorrow' is true if and only if Jim races tomorrow).

Mellor begins his argument by setting out the ways in which A- and B-facts would go about being truthmakers; he notes that the concept of truthmakers is still problematic, but implies that he feels confident enough of their acceptability to proceed (*pace* Craig, who states 'Mellor just assumes a truthmaker ontology, which is a controversial assumption'³¹², implying that Mellor does *not* acknowledge this). Thus:

If today is 1 June, the A-truthmaker for 'Jim races tomorrow' is Jim's racing *a day later than today*, while its B-truthmaker is his racing *a day later than 1 June*.³¹³

Mellor argues that, in order to make B-truthmakers a reasonable idea, he has to show how B-facts – which are always facts; they all exist – cope with making various propositions true at some times and false at other times. The A-truthmaker above exists only on the 1 June; if Jim races again a month later, there will be a different A-truthmaker existing, although this will be another, separate, fact of Jim racing tomorrow.³¹⁴

Thus, Mellor argues that 'because B-facts, unlike A-facts, do not come and go ... no single B-fact can make "Jim races tomorrow" true at some times and not at others.'³¹⁵ Consequently, 'it takes as many B-facts as there are times at which an A-

³¹⁰ The reason for going through the development of the position is that some of the earlier material is necessary for understanding later manoeuvres; the development takes place as it does because Mellor is building, in *Real Time II*, on material he expounded in D. H. Mellor, *Real Time* (Cambridge: Cambridge University Press, 1981).

³¹¹ Mellor, *Real Time II*, p.25

³¹² Craig, *The Tensed Theory of Time*, p.92

³¹³ Mellor, *Real Time II*, p.26

³¹⁴ How we tell the difference between each truthmaker is another matter, and a problem for the A-theorist that the presentist may attempt to solve by arguing that only one truthmaker of that type will ever exist at any one time, and only the present exists, so no distinction is required.

³¹⁵ Mellor, *Real Time II*, p.27-8

proposition can have independent truth values.³¹⁶ In other words, ‘it takes a new B-fact to make “Jim races tomorrow” true or false each day.’³¹⁷

Mellor decides to build his account of B-facts by starting with the type/token distinction for the class of truth bearers. He notes that a belief-type (e.g. ‘Jim races tomorrow’) will have as its tokens individual belief-occasions of this (mine, yours, Jim’s brother’s). Further, he argues, we should introduce a time component, since you or I (or Jim’s brother) will have the belief-type at various times.

This makes the belief-tokens we need facts: my believing a proposition ‘P’ at a given A- or B-moment, *t*. And if *t* is a B-moment, then even if ‘P’ is an A-proposition, my believing it at *t* is a B-fact, entailing nothing about how much earlier or later it is than the present.³¹⁸

Thus, there are presumably truth bearer types, of which there are various tokens, and because the tokens take the form of ‘*x* believes *P* at *t*’, they take the form of facts. ‘That B-facts can be tokens of A-propositions is crucial to the B-theory.’³¹⁹ What Mellor plans to do is to make the truthmakers for truth bearer types rely upon – or partially *be* – the tokens of those types.

Mellor goes on to say the following, for which a great deal of clarification will be required:

I must stress therefore that [B-facts being tokens of A-propositions] is not a peculiarity of token beliefs, arising from the fallibility which, for most *P*, stops my believing “*P*” entailing *P*. For even if I *know* on 1 June that Jim races tomorrow, which does entail that he races then, my token knowledge is still not an A-fact. For first, all it entails is that my belief that Jim races tomorrow is true, not that what *makes* it true is an A-fact, which is the point at issue. And second, my knowing on 1 June that Jim races tomorrow entails only the B-fact that he races on 2 June. It does not entail the A-fact that he races *tomorrow*, for it does not entail that 1 June is today.... Whatever my attitude to the A-proposition that Jim races tomorrow, my having that attitude at any B-moment is a B-fact, not an A-fact.³²⁰

Craig claims that Mellor makes a mistake, in that ‘double indexing requires that no matter where in the present or past 1 June is, the race will be tomorrow. If we know that “tomorrow” refers to 2 June, then my knowing on 1 June that Jim races tomorrow entails that today is 1 June.’³²¹ So what is known on 1 June is an A-fact. Craig’s point is grounded in his treatment of temporal indexicals. He wishes to claim that ‘it is clear

³¹⁶ Mellor, *Real Time II*, p.27-8

³¹⁷ Mellor, *Real Time II*, p.27-8

³¹⁸ Mellor, *Real Time II*, p.29

³¹⁹ Mellor, *Real Time II*, p.29

³²⁰ Mellor, *Real Time II*, p.30

³²¹ Craig, *The Tensed Theory of Time*, p.94-5

what the ostensible function of temporal indexicals is: they ascribe A-determinations and/or A-positions.³²² However, it is not clear to the reader how he gets to this claim from his earlier assertion that temporal indexicals have ‘linguistic rules determined by the meaning of the words which stipulate that the time referred to is a moment or interval earlier than, simultaneous with or later than the time of any tokening of the sentence.’³²³ Nevertheless, Craig’s account would appear to be this:

- 1) I know on 1 June that ‘Jim races tomorrow’.
- 2) This entails that Jim races on 2 June.
- 3) Knowing that Jim races on 2 June entails knowing that today is 1 June.
- 4) So what I know is not that Jim races ‘the next day’, but that Jim races *tomorrow*.

Some careful attention is required to disentangle this with respect to what Mellor really wants to say. What can start with what everyone agrees on:

- (i) x believing ‘Jim races tomorrow’ on/at 1 June is a B-fact.
- (ii) ‘Jim races tomorrow’ is a tensed belief.
- (iii) That Jim races on 2 June is a B-fact.

What we need is a way to differentiate the perspectives that the example employs.

- a) x knows (at 1 June, ‘Jim races tomorrow’) entails x knows (Jim races at 2 June, today is 1 June) and entails that Jim races on 2 June.
- b) At 1 June x knows (‘Jim races tomorrow’) entails x knows (Jim races one day later than x ’s tokening of the belief), and entails that Jim races on 2 June.

However, from our perspective both (a) and (b) entail that Jim races on 2 June, because we are provided with the date of x ’s tokening in each case. But in the first case, x knows what the dates are, and in the second case x does not. So, in the first case x actually knows all the B-facts that contribute to making ‘Jim races tomorrow’ true. In the second case, x knows that x ’s tensed belief is true, but does not know the B-facts. As Mellor suggests, this does not mean that the fact making x ’s belief true is tensed rather than tenseless. What is common to both cases is that there is a B-fact (at t , x

³²² Craig, *The Tensed Theory of Time*, p.14

³²³ Craig, *The Tensed Theory of Time*, p.11

knows P) and that this entails a B-fact (Jim races at t') and that the latter B-fact being relevantly B-related to the occurrence of P is what makes P true.

One might object that it is unclear in (b) what x knows if x does not know the B-fact that Jim races on 2 June, and that part of the entailment in (a) is that 'today is 1 June', which rather looks like a tensed fact. In the former case (if one wishes to avoid being bloody-minded and simply asserting that x knows x 's tensed belief is true) one can suggest something like this: imagine a situation in which you do not know any B-series dates or times (i.e. do not know the date of tokening, nor the date of racing, nor the time of racing). What then do you know, and how would you go about seeing Jim race? Let us assume that Jim never races in the dark. You know that at some time from the sunrise-to-sunset subsequent to your tokening 'Jim races tomorrow', Jim races. So presumably the sort of behaviour motivated will involve hanging around the racetrack, trying to find more specific information about times, etc. The tensed belief is vital to motivate timely action, but what makes it true is not thereby an A-fact – and the lack of B-data means that the action motivated is different. Nevertheless, it cannot fail to be the case that if x knows P then *at some B-position* x knows P. This is a B-fact, and in our example it entails a B-fact about when Jim races. The relation between the latter and P is what makes P true.

Against the second objection we can argue something very specific (which, as we shall see shortly, gets to the heart of the matter): in (a) 'today is 1 June' is incorporated in the scope of what x knows. This is because the example is couched in terms which index the tensed elements to x 's reference point (1 June). So x does indeed know that 'today is 1 June', but all that tells us is that when it is the 1 June it is true to say that 'today is 1 June'. This is not the same as saying that today absolutely is 1 June. I think this is what Mellor is getting at when he says 'It does not entail the A-fact that he races *tomorrow*, for it does not entail that 1 June is today.'³²⁴ (Mellor's italics). However, in the way that Mellor puts it, a chink is provided for Craig to exert leverage in favour of tensed facts; hopefully the treatment just provided closes down that chink. It will also provide the key to resolving Craig's criticism of Mellor's account in its final form.

Mellor concludes overall that 'In short, all tokens, however diverse, of any A-proposition "P" for which we need B-truthmakers, have B-times which (given "P") fix their truth or falsity in any given world.'³²⁵ Thus, he moves towards a concept of B-

³²⁴ Mellor, *Real Time II*, p.30

³²⁵ Mellor, *Real Time II*, p.31

truthmakers which employs the tokens themselves in their role of forming facts when part of the schematic ‘ x believes (etc.) P at t ’. ‘So the B-fact that makes a token of “Jim races tomorrow” true seems to be this: the fact that the token is located a day earlier than the day on which Jim races.’³²⁶ Mellor generalises this (for A-propositions ‘ P ’ and events ‘ e ’) to:

Any token of ‘ P ’ is true iff it is as much earlier or later than e as ‘ P ’ says the present is than e .³²⁷

Where A-propositions employing present terms (now, today, etc.) are concerned, the truthmaker’s relation is simultaneity. For example, ‘It’s my birthday today’ is made true by, and only by, its being uttered on the same day(s) as my birthday occurs.

The above represent the core ideas of Mellor’s B-theory, but, as Mellor himself admits, it is ‘not good enough, because a token-reflexive theory gives some A-propositions the wrong truth-values.’³²⁸ He moves on to address the issue of untokened propositions. The example Mellor works with is the pairing ‘There are tokens now’ and ‘There are no tokens now’³²⁹, and he helpfully recasts the problem as follows:

Whatever makes [‘there are no tokens now’] true at any A- or B-time t , it cannot be what makes [its] tokens true then, since these tokens are never true. What then does make [‘there are no tokens now’] true at a time t when, as it says, there are no tokens?

Mellor’s answer is that it is a fact about the time of consideration that makes *true* A-propositions, including untokenable ones, true. It is the fact of there being no tokens at a certain moment that makes the A-proposition ‘there are no tokens now’ true at that moment in particular, and the fact that there *are* tokens at a moment that makes ‘there are no tokens now’ false at *that* moment. Mellor generalises this to:

Any A-proposition ‘ P ’ about any event e is made true at any t by t ’s being as much earlier or later than e as ‘ P ’ says the present is than e .³³⁰

Again, propositions employing e.g. now, today, etc., are catered for by the simultaneity relation. So ‘it’s my birthday today’, as a P -type rather than a token, is made true at any

³²⁶ Mellor, *Real Time II*, p.31

³²⁷ Mellor, *Real Time II*, p.31

³²⁸ Mellor, *Real Time II*, p.32

³²⁹ Mellor, *Real Time II*, p.32

³³⁰ Mellor, *Real Time II*, p.34

time by that time being simultaneous with my birthday event(s). This is more useful than the token-reflexive formulation, because it does not demand the existence of tokens to provide the relevant facts, and therefore the truthmakers, for a proposition/sentence type. Consequently, one can, as it were, see the whole set of solutions for the equation instead of taking one instance at a time. For example, the sentence type 'Jim races tomorrow' will be made true at any time of consideration, when it *is* true, by Jim's racing being a day later than the time of consideration, and will be made false, when it *is* false, by Jim's racing *not* being a day later than the time of consideration. This also lets us know that any tokens will be truly uttered on the relevant days (taking into account Craig's previous protestation that tokens cannot be true or false, but only truly or falsely uttered³³¹).

Craig reacts to Mellor's proposals with great dismay. He argues that they provide neither truth conditions nor truthmakers for P, because the situation has been altered to provide conditions or truthmakers for 'P at *t*'. 'But we want to know what makes (present tense) P true. We want to know, not what makes *Jim races tomorrow* true on June 1, but what makes it true that *Jim races tomorrow* or that *Jim is racing*.'³³² What Craig wants, we remind ourselves, is 'The fact of 1980's being present makes "It is now 1980" (presently) true.' For 'if there are no tensed truthmakers, then it is inexplicable why P is true – not true at *t*, mind you, but simply true.'³³³

If my treatment of the 'Jim races tomorrow' case above is not faulty, then the problem here can be diagnosed and resolved to some extent. For it suggests that any instance of P will be indexed to a B-time *t*. Just as we saw that x's knowledge of 'today is 1 June' on 1 June did not amount to a tensed fact that *today* is 1 June, so we can see that Craig's demand for what makes 'Jim races tomorrow' true is a demand for a tensed fact that is malformed given Mellor's structure of B-facts and tensed beliefs. The tenseless theorist might say the following: What if we opt for fully tensed facts? Jim races tomorrow is true because Jim's racing is one day future, or one day after the day which has the property of being present. But the former encounters the problem of being one day future of *what*, whilst the latter encounters a problem of absolute and relative present: in 1998 Mellor said 'Jim races tomorrow', and I know this statement to be true because Jim raced one day later than the present. But whose present? Mellor's present, because Jim does not race at all in 2007, so Mellor's statement cannot be true in

³³¹ Craig, *The Tensed Theory of Time*, pp. 77-83

³³² Craig, *The Tensed Theory of Time*, p. 95

³³³ Craig, *The Tensed Theory of Time*, p. 96

virtue of Jim racing one day after ‘absolute today’, i.e. the present. Is Craig smuggling the ‘at t ’ element in through the back door?

The measured response should, I think, be that Mellor is not failing by making ‘P at t ’, rather than P *simpliciter*, what is made true. But neither is Craig smuggling anything in or being unreasonable in wanting the truth of P *simpliciter*. Instead, Mellor is providing a coherent account that fits with a B-theoretic view of the world, and Craig is asking for an account that fits with a presentist view of the world. If presentism is false, then surely it is not sensible to ask what makes ‘Jim races tomorrow’ simply true, and more than it is sensible to demand ‘the’ answer to an equation that has more than one possible solution. If presentism is true, however, then the treatment of the entailment ‘today is 1 June’ (in (a) above) that I have given will be faulty because there is no possibility of x ’s ‘today’ being anything other than the absolute and only present, and it will consequently make perfect sense to ask what makes ‘Jim races tomorrow’ true *simpliciter*, and argue for the answer that it is just the tensed fact that Jim races tomorrow. This will be brought out more powerfully in the criticism of Craig’s position from special relativity (note that this means that Mellor’s account cannot therefore be considered in the category of arguments independent of science). In light of that discussion, it should be visible, if the criticism is accurate, Craig’s physics is awry, and thus a B-theory can claim support from science, that special relativity will bear out Mellor’s position that truth must be ‘truth at t ’, since for a proposition to be ‘simply true’ is for us to assume that there is a single, common value for t for everyone.

In conclusion, then, I suggest that Mellor’s account does not fall to Craig’s criticism of it, but neither does it present a knock-down independent argument for a B-theory approach. The success of Mellor’s tenseless theory, as an argument centred on language and truthmakers, remains dependent (as he himself I think would allow) on the failure of A-theoretic positions.

Objections to Presentism

Having discussed the mechanics of truthmakers and tensed or tenseless discourse from the perspective of presentism criticising B-theory, we ought to see how presentism’s own position holds up under critical analysis. Towards the end of the previous chapter, we noted that the view that the present is all that exists is generally held to be the easiest (and perhaps only) A-theoretical way to avoid the force of McTaggart’s paradox, and we saw five points that Le Poidevin makes about Prior’s

presentism (which Le Poidevin terms ‘temporal solipsism’ to avoid confusion with Quentin Smith’s theory), which Craig claims to evade in his own theory. We can recall them as follows:

1. The extension of the existential quantifier is restricted to presently existing objects.
2. Relations obtain only between contemporaries, that is, objects existing at the same time.... Apparent relations between non-contemporaries ... must be analysed in terms of some present fact.
3. Past and future tenses are to be interpreted as sentential operators on core present-tense sentences, the present tense *not* requiring to be represented by an operator.... The import of this is that present truth is truth *simpliciter*.
4. Instants are logical constructions out of propositions.... An instant, that is, is equated with all the propositions which would ordinarily be described as being (contingently) true at that instant.
5. Past- and future-tense statements have only present facts as their truth conditions, that is, what makes a certain statement about the past or future true is the evidence that at present exists.³³⁴

I shall be concentrating on arguments arising from two of these in particular: in line with the subject matter of the chapter so far, the fifth point is evidently of special interest, and the second point can be considered in terms of the question ‘how should we construe cross-time relationships if the present is all that exists?’ Consequently it is of common concern with the question of truth-makers; indeed Le Poidevin observes that the fifth guarantees the second³³⁵. I shall begin by using Le Poidevin’s discussion of presentism in *Travels in Four Dimensions*³³⁶ as an introduction to the subsequent, more detailed, material centred on the work of Ted Sider³³⁷, which will also include some analysis of the issue of tense operators and consequently of the elements of point (3) which have a bearing on points (2) and (5).

Le Poidevin begins from the position that presentism (understood as the assertion that the past and future are unreal) may be thought of as quite an intuitive position, but we must ask first what it means for the past and future to be unreal and then, if the past is unreal, what makes our statements/beliefs/memories of it true.

³³⁴ Le Poidevin, *Change, Cause, and Contradiction* (New York: St. Martin’s Press, 1991), p.37; cf Craig, *The Tensed Theory of Time*, p.208

³³⁵ Le Poidevin, *Change, Cause, and Contradiction*, p.38

³³⁶ Le Poidevin, *Travels in Four Dimensions* (Oxford: Oxford University Press, 2003), pp.135-140

³³⁷ Theodore Sider, *Four-Dimensionalism: An Ontology of Persistence and Time* (Oxford: Clarendon Press, 2001)

To answer the first question, he compares colour and fictitious characters. Arguing that we would be unlikely to accept that the past is unreal in the sense of fictitious, he suggests that this leaves us with an account that is more like Democritus' atomism (an account similar again to how we might think of colour) – i.e. that there is a reality that makes some beliefs and statements true, but this reality does not contain e.g. colour because it is more fundamental (in Democritus' case, it is all about atoms).

Turning to the second question, he criticises the view thus formed – that it is present reality that makes true beliefs about the past – on the grounds that many different pasts are compatible with the way the world is now (i.e. the present underdetermines the past), so that the presentist is forced to assume that only one past is compatible with the present. Le Poidevin pushes the criticism further. How, he asks, can the presentist talk about this presumably causal mechanism? What makes “the past leaves causal traces on the present” true? The presentist must assert that present fact makes such a statement true.

But what purely present fact could make true a statement about the causal relations between different times? We can make sense of a past event leaving its causal traces on the present...but can we make sense of the *causal relation* between that event and the present traces *itself* leaving its traces on the present?³³⁸

Thus, the presentist is placed in the position of having to relate events at different times, which apparently requires each event and (/or) each time to be part of reality. The presentist cannot allow this, and so cannot assume the best apparent mechanism for explaining the truth of past-related statements by present reality. Coming, in a sense, full circle, Le Poidevin points out that the view that causal relations link events at different times may *also* be thought of as an intuitive view. The presentist appears to be in some difficulty, for even if the mechanism can be formed to avoid the causal problem, the presentist will still have to deny an intuitive view of causal relations *as well*.

Le Poidevin makes a further point that could be made to weigh against a reliance on tensed operators. He asks, on behalf of the presentist, why one could not just say ‘that such-and-such was the case’³³⁹? He argues that this makes it unclear what is meant by denying the reality of the past, since without something to account for this

³³⁸ Le Poidevin, *Travels in Four Dimensions*, p.139

³³⁹ Cf e.g. Craig, *The Tensed Theory of Time*, p.190 for a very concise expression of this from his viewpoint.

unreality one is left with ‘the trivial truth that the past is not part of *present* reality’³⁴⁰. This is something that even a B-theorist could accept if they were careful enough to phrase it properly (e.g. if we are at t_2 , although t_1 and t_2 are equally extant nevertheless t_1 is not simultaneously extant with t_2 , because they are two different times; the part of reality that t_1 represents is not part of t_2 ’s part of reality). Thus we could extend the point to argue that tense operators alone will not secure very much for the presentist, since a justification for the unreality of the past and future is also needed.

Let us now take a look at the first detailed objection, which in Sider’s work combines some critical appraisal of tense operators with an extensive analysis of cross-time relations. Having observed that the presentist requires operators ‘WAS ϕ ’ and ‘WILL ϕ ’, and their metrical equivalents ‘WAS, n units of time ago, ϕ ’ and ‘WILL, n units of time hence, ϕ ’, he argues that an objection thereby arises ‘that the presentist must deny the truth of everyday claims that concern multiple times taken together.’³⁴¹ He takes as an example that some Greek philosophers are admired by some American philosophers. Sider argues that the scope of the WAS operator becomes problematic: one does not wish to assert that the Greeks currently exist, nor that the Americans’ existence is in the past, nor that the admiration took place when the Greeks existed, nor that the admiration is co-temporal with both the Americans and the Greeks existing at some present or past point: ‘It is rather a fact about two times at once.’³⁴² Sider asserts that the simplest way out appears to be to make the operators ‘span’ rather than ‘slice’. Yet, he argues, this falls foul of the presentist’s own conceptualisation:

For example, the sentence ‘WAS $\exists x \exists y (x = \text{Socrates and } y = \text{Kant})$ ’ is true of many spans of time in the past. And yet since there is no one instant at which Socrates and Kant exist, this component sentence ‘ $\exists x \exists y (x = \text{Socrates and } y = \text{Kant})$ ’ constitutes a violation of the presentist doctrine that there cannot exist non-present things – if two things never exist at the same instant then one or both must fail to exist at the present time.³⁴³

Sider goes on to analyse the presentist options for ‘slice’ tense operators. He gives three possibilities: to paraphrase problematic sentences into true tensed sentences, or to admit that the sentences are not true but provide grounding reasons (‘underlying truths’), or to admit that they are not true and explain why they appear to be true to us. All of these options have certain similarities with the tense reduction projects of B-theorists of language.

³⁴⁰ Le Poidevin, *Travels in Four Dimensions*, p.140

³⁴¹ Sider, *Four-Dimensionalism*, p.25

³⁴² Sider, *Four-Dimensionalism*, p.26

³⁴³ Sider, *Four-Dimensionalism*, p.27

Sider re-states the problem of relating entities/events at different times ('I have in mind spatial comparisons between objects at different times'³⁴⁴):

The problem, roughly, is that these comparisons seem not to be captured by sentences formed from the presentist's tense operators since they involve comparing what happens at one time with what happens at a different time.³⁴⁵

The presentist can, he argues, resolve the matter by accepting a concept of 'substantival space' with 'enduring places'; in other words a concept of space whereby there is a constant set of places which always stand in the same spatial relations, and where these are occupied by material objects at particular times. Thus, he argues, the presentist could cash out the claim that there used to be something with property *F*, in the place now occupied by *a*, by stating:

(*) There is a place *p* occupied by object *a*, and WAS (there is something occupying *p* with property *F*).³⁴⁶

However, this clearly requires a defence of absolute comparisons of position, which goes 'far beyond the *relative* comparisons of position that are required for science' and for which 'there is no empirical basis.'³⁴⁷ Sider devotes significant effort to an explanation of this position. He describes it as arising from the Newtonian requirement for any acceleration to be occurring with respect to something. For example, in the famous thought experiment of the rotating bucket, a world containing nothing but a bucket of water presents empirical data as to whether the bucket is stationary or rotating (in the latter, the surface of the water forms a meniscus). Rotation is a form of acceleration, but if the world contains nothing but the bucket and acceleration is always with respect to something, then absolute positions must be postulated in order to have a 'something' with respect to which the bucket rotates.

Sider goes on to describe the way in which modern physics has changed its thoughts on this point, 'as the subsequent development of spacetime geometry has shown... absolute position is not required to make sense of absolute acceleration.'³⁴⁸ He observes that in both neo-Newtonian and Minkowski spacetime, the geometry of the structure is such that the straight lines of the spacetime manifold characterise paths of

³⁴⁴ Sider, *Four-Dimensionalism*, p.28

³⁴⁵ Sider, *Four-Dimensionalism*, p.28

³⁴⁶ Sider, *Four-Dimensionalism*, p.28

³⁴⁷ Sider, *Four-Dimensionalism*, p.28

³⁴⁸ Sider, *Four-Dimensionalism*, p.29

unaccelerated particles, so that absolute positions are not required. The difference, then, between the original space/time and the new space-time is as follows: in the former, the geometry functions through four dimensional variables (x, y, z, t) which makes sense of cross-time comparison by employing (potentially) the same {x, y, z} number-values for different t-values. However, in the space-time geometry, the affine (preserving parallel relations) structure allows only for the specification of a straight line: 'One way of doing this is to introduce a three-place relation on the points of the space, $R(x, y, z)$, interpreted as meaning that point y is *linearly between* points x and z.'³⁴⁹ R , having been given proper mathematical characterisation, allows various classes of points within the structure to be related under the concept of a straight line, but 'there will be no binary [i.e. two-place; $R(x,y)$] relation on points definable from R that would represent two place-times as being *at the same position*.'³⁵⁰

What the modern geometry *does* allow for is the straight lines to represent the paths of unaccelerated bodies, so that the need to distinguish between accelerated and unaccelerated bodies can be fulfilled without positing a relation of 'same position as'. The rotating bucket experiment can therefore be accounted for without needing to resort to absolute positions. Sider concludes that the presentist cannot therefore *presuppose* the absolute comparisons of position used for cross-time spatial comparisons in propositions such as (*). The presentist's options are therefore *either* to find a way of paraphrasing 'spacetime talk' by use of tense operators (now very difficult, since forms like (*) are disallowed because they presuppose an outdated geometry), *or* to argue a version of presentism which is scientifically revisionary. Pursuing this line of argument therefore requires a prior settlement on the issue of whether and how science can confirm, or be discounted from, metaphysical claims.

Sider's own view is that the line of argument is doomed, and he turns instead to consider 'claims of *object relative* spatial positions over time'³⁵¹, giving the example:

It WAS/WILL BE the case n units of time ago/hence that: (Ted Sider is 5 feet from Bill Clinton).³⁵²

He argues that this approach is also faulty because it omits essential information about variation in spatial location over time. One cannot, of course, employ absolute-position

³⁴⁹ Sider, *Four-Dimensionalism*, p.30 N.B. 'points' here are understood as 'place-times - places at an instant'. (Sider, *Four-Dimensionalism*, p.29)

³⁵⁰ Sider, *Four-Dimensionalism*, p.30

³⁵¹ Sider, *Four-Dimensionalism*, p.31

³⁵² Sider, *Four-Dimensionalism*, p.31

concepts to track Clinton's movements, and so there are three seemingly inarbitrable possibilities to describe Sider's movements with respect to Clinton:

(P1) I have moved along a continuous unaccelerated path.

(P2) I have moved along a continuous but accelerated path.

(P3) I have moved along a discontinuous path.³⁵³

Sider argues that the presentist cannot resolve this three-way tie. Arguing again from modern space-time geometry (and thus once again avoiding any counter-arguments from scientifically revisionist versions of presentism), Sider points out that the presentist position forms 'a series of "snapshots" of the world at successive moments of time'³⁵⁴ each snapshot corresponding to the sentence form:

It WAS/WILL BE the case n units of time ago/hence that: ϕ ³⁵⁵

Whereas the B-theoretical/perdurantist supporter of spacetime geometry has no difficulty in picking out Sider's path relative to Clinton, the presentist cannot specify from the snapshot sentences alone how the snapshots should line up, and so which of (P1-3) are true, 'since such facts [P1-3] are not facts about what things are like at any one time.'³⁵⁶

Thus, it appears that the presentist cannot accommodate the $R(x,y,z)$ straight-line facts and the curved-line (acceleration) facts in a tensed translation. Sider explores two options - one of 'bridge principles' and one of incorporating state-of-motion data within snapshots - potentially open to the presentist for solving the problem of differentiating dynamic facts. Beginning with 'bridge principles', he states that the most obvious form taken by such principles would be something like 'if the series of snapshots take a certain form, *then* the snapshots "automatically" line up in such and such a way,'³⁵⁷ with the principles constructed to favour certain models of motion (e.g. continuous rather than discontinuous).

Consider constructing an eternalist model of the world, an abstract neo-Newtonian spacetime with a selected time to serve as the present moment, based on the set **P** of the totality of the presentist's tensed truths. **P** constrains what goes on at the various times

³⁵³ Sider, *Four-Dimensionalism*, p.32

³⁵⁴ Sider, *Four-Dimensionalism*, p.32

³⁵⁵ Sider, *Four-Dimensionalism*, p.32

³⁵⁶ Sider, *Four-Dimensionalism*, p.32

³⁵⁷ Sider, *Four-Dimensionalism*, p.32

of the model, including single-time spatial relations between objects, but does not constrain cross-time spatial relations.³⁵⁸

This process will function as a selector of snapshot alignments, since **P** will provide data for the spatial relations at each time and then alignments can be selected according to, for example, a principle of maximisation of continuous and unaccelerated motion, such that the spatial relation between a pair of objects varies linearly over a sequence of snapshots.

Consider, now, the class **E** of eternalist models that are consistent with **P** and maximise continuous and unaccelerated motions. In any such model one can evaluate the truth value of a sentence (like (P1)-(P3)) that makes a cross-time spatial comparison. The presentist, then, can say that one of these sentences is true iff it is true in every member of **E**.³⁵⁹

In other words, given three cross-time spatial relation possibilities between Sider and Clinton, we can evaluate which is true by plugging the tensed truths snapshots into a set of spacetime models, using a bridge principle maximising continuous and unaccelerated motion, and then checking each proposition against the relevant alignments which result.

On this view, possibilities (P1) through (P3) can be distinguished in cases where the world is sufficiently rich. If the world is like the actual world, containing a vast number of things in motion, most of which are moving inertially (or nearly inertially), there will be only one way of lining up the 'snapshots' that maximises continuity and unaccelerated paths. Relative to this way of lining up the snapshots, some particles may undergo non-inertial or discontinuous motion. But in simple cases, possibilities (P2) and (P3) will disappear.³⁶⁰

However, there is a sting in the tail of Sider's account. He observes that in simpler worlds, most clearly in worlds featuring a single particle, the above solution produces the result that the particle moves inertially at all times, and the presentist must deny the possibility that it will move through accelerated or discontinuous paths. Given that such paths are entirely feasible, the presentist must commit to an unpersuasive reduction of views of cross-time spatial relations, which the eternalist viewpoint can retain in all their variety. Consequently, Sider argues, cross-time spatial relations favour the eternalist 'solution' over the presentist solution.

³⁵⁸ Sider, *Four-Dimensionalism*, p.32-3

³⁵⁹ Sider, *Four-Dimensionalism*, p.33

³⁶⁰ Sider, *Four-Dimensionalism*, p.33

Before moving on to his so-called ‘truth-maker objection’, Sider considers the possibility that the presentist could evade the problem of state-of-motion data by including the information within the ‘snapshot’, thereby rendering unnecessary any principles of alignment.

Which of (P1) through (P3) holds would then depend on which of the following groups of tensed claims is true:

(G1) I am not accelerating AND

WAS-1-minute-ago (I am not accelerating) AND

WAS-2-minutes-ago (I am not accelerating) AND

etc.

(G2) I am accelerating AND

WAS-1-minute-ago (I am accelerating) AND

WAS-2-minutes-ago (I am accelerating) AND

etc.

(G3) I am moving discontinuously OR

WAS-1-minute-ago (I am moving discontinuously) OR

WAS-2-minutes-ago (I am moving discontinuously) OR

etc.³⁶¹

Sider criticises this solution to the problem of cross-time spatial relations by arguing that G(1-3) are ‘not ultimate, but must be grounded in facts of location over time ... these facts are precisely what I have been arguing the presentist cannot capture.’³⁶² He argues this point through two theories of motion, one from Russell and one from Tooley. In the Russellian theory, neither acceleration nor velocity can be ‘an intrinsic property of an object at a time’³⁶³, since both are dependent upon the positions of the object immediately before and immediately after that time³⁶⁴. Given this, G(1-3) require grounding facts of position over time, which puts the presentist back with ‘It WAS/WILL BE the case n units of time ago/hence that: ϕ ’ and the problem of P(1-3).

Tooley’s theory ascribes velocity to objects as a fact about what an object is like at a time (so that velocity seems to be an intrinsic property). Sider points out that

³⁶¹ Sider, *Four-Dimensionalism*, p.33-4

³⁶² Sider, *Four-Dimensionalism*, p.34

³⁶³ Sider, *Four-Dimensionalism*, p.34

³⁶⁴ To have velocity is to have a non-zero first derivative of the position function; to have acceleration is to have a non-zero second derivative of the position function.

velocity is still connected to spatial relation: ‘velocities are irreducible “first-order” properties that are *picked out* as those properties that are, in fact, nomically correlated with the first derivative of the position function.’³⁶⁵ Thus, ‘according to Tooley, we are to pick out velocity by its role in the laws of nature. This role concerns the relation between velocity and spatial position over time.’³⁶⁶ This leaves Sider able to conclude that, although velocity is not dependent upon spatial location in the way that it is in the Russellian theory, nevertheless (since velocity cannot be entirely *unrelated* to position, and indeed is not for Tooley) Tooley’s theory does not provide the presentist with enough room to manoeuvre so as to vindicate G(1-3) as ultimate, and the argument from cross-time spatial relations is still effective against the presentist position.

Let us now take a look at the second detailed objection: Sider’s ‘truth-maker objection’. He begins: ‘the presentist claims that “WAS (there exist some dinosaurs)” is true. But if there do not exist any past dinosaurs, what *grounds* the truth of this sentence?’³⁶⁷ From this point, he assesses two ‘grounding principles’; one a fairly standard concept of truth-makers, and one the principle that ‘truth is supervenient on being’, a view designed to circumvent problems with the standard truth-maker view. Sider intends to analyse the presentist position with respect to these two principles, arguing that whichever route is taken will result in the presentist ‘cheating’ in order to make the account fit with their views.

However, before discussing Sider’s approach, something must be said about the two grounding principles. The truth-maker principle; ‘for every truth, T, there exists an entity – a ‘truth-maker’ – whose existence suffices for the truth of T’³⁶⁸, arises from the work of Russell and Wittgenstein in conceiving of ‘facts’ or ‘states of affairs’ as the objects composing the world, and has been developed by, for example, David Armstrong³⁶⁹. The sorts of problems that arise for this view come from negative existentials: positive states of affairs (that I am typing on my computer keyboard) are easy to find truth makers for (me; my keyboard; the relation between the two). However, ‘even very large positive states of affairs are not truth-makers for “there are no unicorns”, for given any such state of affairs, *S*, it would be possible for there to exist a unicorn *in addition to S*.’³⁷⁰ Clearly there are approaches which could be used to

³⁶⁵ Sider, *Four-Dimensionalism*, p.35

³⁶⁶ Sider, *Four-Dimensionalism*, p.35

³⁶⁷ Sider, *Four-Dimensionalism*, p.35-6

³⁶⁸ Sider, *Four-Dimensionalism*, p.36

³⁶⁹ David Armstrong, *A World of States of Affairs* (Cambridge, Cambridge University Press, 1997)

³⁷⁰ Sider, *Four-Dimensionalism*, p.36

resolve such problems³⁷¹, but Sider is concerned to set up a different view so as to provide an alternate model of critical analysis for his treatment of presentism.

The alternate model is that found in the work of, for example, John Bigelow³⁷². Sider expresses the grounding principle thus: ‘what is true supervenes on what objects exist, what properties those objects have, and what relations they stand in.’³⁷³ In this way, the lack of unicorns in the world is not demanded as a concrete fact; rather, the objects, properties and relations in the world are such that the proposition is true, and would be true in any world with the same combination of objects, properties and relations.

Sider notes that, at first glance, presentist tensed truths seem to ‘float free of the world’ in an unacceptable way, neither having truth-makers nor supervening on being, since ‘all states of affairs are *currently existing* states of affairs, and the properties and relations of objects are confined to those of *currently existing* objects.’ Where does this leave propositions about dinosaurs, some of which we would like to say are true or false and for which we need either truth-makers or objects with properties and in relations? Bigelow is a presentist, which gives Sider the opportunity to explore more fully the tension between presentist tensed truths and grounding principles. Sider canvasses two options: ‘What [Bigelow] claims is that the world – the sum total of everything – instantiates properties like *previously containing dinosaurs*. Tensed truths then supervene on the instantiation of these properties (Bigelow 1996).’³⁷⁴ The alternative, truth-maker, option follows a similar line, employing ‘tensed states of affairs such as *there once existing dinosaurs* as truth-makers.’³⁷⁵ Sider’s critical approach, then, will be to accuse both of these options of ‘cheating’ (which poses a problem for the presentist by demanding as a correlate of presentism that both grounding principles be rejected), but before engaging in this, he first puts forward an argument to show that these two options are the only ones open to the presentist as regards truth-makers or supervenient truths.

³⁷¹ Both McGinn’s work on existence as a property [Colin McGinn, ‘Existence’, in *Logical Properties* (Oxford: Oxford University Press, 2000), p.15-51] and Skorupski’s work on the ‘broader, or nominal, notion’ of a fact [John Skorupski, ‘Irrealist Cognitivism’, *Ratio* XII:4 (1999), p.436-459] would allow truth-makers to operate in a mental-linguistic context, which would complement the more empirically-flavoured context of the Russell-Wittgenstein-Armstrong tradition. The presentist would be unlikely to favour such approaches, however, because they suit a distinction between treatments of fiction or treatments of ethics and treatments of ontology or science. The presentist would be wary of committing their view to a system that is ill-suited to ontological evaluation.

³⁷² John Bigelow, ‘Presentism and Properties’, in James E. Tomberlin (ed.), *Philosophical Perspectives, Volume X: Metaphysics* (Cambridge: Blackwell, 1996), p.35-52

³⁷³ Sider, *Four-Dimensionalism*, p.36

³⁷⁴ Sider, *Four-Dimensionalism*, p.37

³⁷⁵ Sider, *Four-Dimensionalism*, p.37

The alternative identified by Sider is to use laws of nature to provide the requisite ‘backwards-looking tool’ to ground tensed truths when only present objects can be taken into account. The idea, then, is to take currently existing states of affairs and employ laws of nature to provide grounding truths for (for example) the existence of dinosaurs in the past. We could take some fossils, use scientific laws about decay, biochemistry, and anatomy and demonstrate that, x million years ago, creatures would have existed which conform to our concept of ‘dinosaurs’, all of which together would entail and guarantee the truth of ‘there once existed dinosaurs’.

However, as Sider explains, we would have to be careful about our account of laws of nature if this approach were to work within a presentist structure. He begins by considering a ‘regularity theory’ of laws, arguing that the presentist would be unable to employ such a theory. Regularity theories are based on the idea that laws of nature take the form of statements of regularity; for example, that all renate creatures are chordate (if something has kidneys, it has a heart). The problem for the presentist is that ‘if tensed facts are to be grounded in the laws, the laws could not themselves be grounded in the tensed facts.’³⁷⁶ Worse, ‘the only regularities available for securing the laws would ... be *current* regularities, and regularity theories are only plausible if the regularities are drawn from all of time.’³⁷⁷ In other words, this sort of law of nature is useless for the presentist to rely on as a grounding of tensed truths, because it relies upon the accrual of data over time combined with the capacity to compare those data. The presentist cannot allow submission of non-present data except in the form of a tensed truth-claim, but this cannot be accepted as a component forming a law which is supposed to be the grounding of such claims.

The need for a stronger account of laws of nature, preferably an account which does not include what it is supposed to be grounding, leads Sider to suggest the view:³⁷⁸

that laws are relations between universals ... [wherein] ... nomic facts are facts over and above the totality of non-nomic facts. A law that all F s are G s involves the holding of a higher-order relation, the nomic necessitation relation, N , between the universals F -ness and G -ness.³⁷⁹

In other words, there are all the usual facts of objects that we can kick about in the world, and then there is a class of extra facts that are about how they interact. This

³⁷⁶ Sider, *Four-Dimensionalism*, p.37

³⁷⁷ Sider, *Four-Dimensionalism*, p.37

³⁷⁸ Comparing David Armstrong, *What is a Law of Nature?* (Cambridge: Cambridge University Press, 1983); Michael Tooley, *Causation: A Realist Approach* (Oxford: Clarendon Press, 1987); Fred I. Dretske, ‘Laws of Nature’, *Philosophy of Science* 44 (1977)

³⁷⁹ Sider, *Four-Dimensionalism*, p.37-8

means, among other things, that there could be regularities which are not law-like as well as ones which are. For example, as far as we know there is no law of nature governing the tendency of men always to squeeze the middle of a toothpaste tube, whereas there is (for the sake of argument) a law of nature governing the occurrence of fog under certain atmospheric conditions. This would be explained by a higher-order nomic necessitation relation holding in the case of the latter, but not of the former. However, in a possible world *W* in which the same regularities were observed, it could be the case that an *N* relation held in toothpaste-squeezing incidents but not in fog-formation incidents. Nevertheless, in principle the presentist would have something to rely upon (present facts plus the class of *N*-type relations representing laws of nature) to ground truth claims about the past.

Sider criticises this approach in three ways. First, noting that in any case this solution would mean constraining presentists to a theory of laws of nature to which they may not wish to commit, he cites argumentation from Lewis and van Fraassen ‘that Armstrong, Tooley, and Dretske cannot explain how *N*’s holding between *F*-ness and *G*-ness could possibly entail the regularity that all *F*s are *G*s.’³⁸⁰ In other words, how does a relation *N* holding between the universals ‘having a heart’ and ‘having kidneys’ actually entail that every creature we examine that has kidneys will have a heart too?

Second, Sider argues that this new presentist solution may give rise to a problem of the open past³⁸¹. Thus:

If the laws of nature are present-to-past indeterministic, current facts plus the laws of nature do not imply all the facts about the past; given presentism and either the truth-maker principle or the principle that truth supervenes on being, for many statements, ϕ , neither ‘it was the case that ϕ ’ nor ‘it was the case that not- ϕ ’ will be true.³⁸²

As Sider observes, most (but not all) philosophers would want to say that there was a fact of the matter as to how the dinosaurs became extinct, even if it is impossible to know the fact.

Sider goes on to argue that even deterministic laws of nature could give rise to a problem of the open past. He returns to the Russellian theory of motion (in which, we remember, velocity of an object at a time is determined by the position of the object in the immediate past and immediate future of that moment), arguing that ‘fixing the properties and relations of present objects will not fix their velocities ... [so that] there

³⁸⁰ Sider, *Four-Dimensionalism*, p.38

³⁸¹ Cf Le Poidevin, *Travels in Four Dimensions*, p.138-139

³⁸² Sider, *Four-Dimensionalism*, p.38

is no hope whatsoever that the laws of nature plus *non-dynamical* properties of present objects will entail anything interesting at all about the past.³⁸³ So, given simply the location of an object now and deterministic laws of motion, we cannot find out about the past locations of the object; we need the velocity, which can only be obtained by cross-time spatial comparison (since it is not an intrinsic property) – but this is not available to the presentist, so the past is effectively open to some extent.

The third objection is on a related point. We remember that ‘according to Tooley, we are to pick out velocity by its role in the laws of nature. This role concerns the relation between velocity and spatial position over time.’³⁸⁴ Sider assesses the potential for this to get the presentist out of trouble, but argues that it fails – just as it did as a solution to cross-temporal spatial comparisons. The reason for this failure lies in the presentist’s need to involve tensed properties of location, since the law relates velocity and location over time and the only way of specifying non-present position (for the presentist) is to use tensed ascriptions of location. So, just as the cross-temporal spatial comparison problem could not be solved using Tooley’s work, because location over time was still a requisite component in some form, similarly the problem of grounding past truths in laws of nature plus present truths cannot be solved using Tooley’s work because (in the presentist’s version) the past-tensed properties of location needed for the law to function are just the sort of truths that are supposed to be grounded by it. In Sider’s words, the grounding principles under consideration

require truths to supervene on, or be made true by, facts about *which* non-tensed properties and relations are instantiated by *which* objects. A law of dynamics, for example [the law in which velocity has a role, enabling us to pick it out], must then hold in virtue of these facts. But it can’t, for once the tensed facts of location are left out, the law ... can only involve the necessitation relation ... and the primitive velocity properties, and thus cannot relate velocity to location.³⁸⁵

The result can only be a choice between leaving in the tensed facts of location, which leads to circularity and collapse, and taking them out – which effectively leaves the ‘shell’ of a law of nature without any way of relating it properly to objects.

Sider’s conclusion is that the only reasonable path open to the presentist wishing to uphold the supervenience or truth-maker grounding principles is to incorporate tense into the relations/properties or states of affairs found in the present, as exemplified respectively in the property *previously containing dinosaurs*, and the state of affairs

³⁸³ Sider, *Four-Dimensionalism*, p.39

³⁸⁴ Sider, *Four-Dimensionalism*, p.35

³⁸⁵ Sider, *Four-Dimensionalism*, p.39 my italics.

there once existing dinosaurs. Sider therefore sets out on the final phase of his criticism, attempting to demonstrate that this path is ‘cheating’ and should not be allowed.

The method of choice in Sider’s demonstration is to take several examples of ‘cheating’, compare them to the presentist’s option, and offer reasons for the presentist’s option to be included in the list. Before turning to Sider’s list, we note for clarity that, in his opinion, ‘in each case the cheater is unwilling to accept an ontology robust enough to bear the weight of the truths he feels free to invoke.’³⁸⁶

Sider begins by stating ‘The point of the truth-maker principle and the principle that truth supervenes on being is to rule out dubious ontologies.’³⁸⁷ The first example of such dubious ontologies is ‘brute dispositions’. A wine glass is likely to shatter if dropped; this represents a disposition. ‘It would be illegitimate to claim that the glass’s disposition to shatter is completely brute or ungrounded.’ Rather, we would want to say that, possibly in accordance with some laws of nature, this disposition is grounded in some non-dispositional property (or properties) of the glass – for instance, the property of having a crystalline structure.

The second example is ‘brute counterfactuals’. ‘Most would say that when a counterfactual conditional is true, for example “this match would light if struck”, its truth must be grounded in the actual, occurrent properties of the match and its surroundings.’³⁸⁸ However, if we posit a new ‘P-frog’, specifying that ‘this sort of frog would turn into a prince if kissed’, then this counterfactual is entirely ungrounded in any existing objects (we have no support either from the properties of frogs, or from the properties of princes, or from the contextual elements of frog-kissing). This is why it makes sense to relegate this sort of situation to the realms of fiction, rather than to consider the metaphysical possibilities, presented by the existence of P-frogs, on the same footing as those presented by boxes of matches.³⁸⁹ Thus, the counterfactual ‘this sort of frog would turn into a prince if kissed’ is ‘brute’, and represents a dubious ontology.

³⁸⁶ Sider, *Four-Dimensionalism*, p.41

³⁸⁷ Sider, *Four-Dimensionalism*, p.40

³⁸⁸ Sider, *Four-Dimensionalism*, p.40

³⁸⁹ Sider uses an example from Plantinga; however it is far from clear that this works, since it turns on the sort of existence possessed by uncreated essences. Sider’s argument is that there are counterfactuals about what a creature would do in certain situations if created, and these will be true whether or not creation takes place; this he sees as a dubious ontology. However, he specifies with Plantinga that creation is the decision to cause an individual essence (which ‘exists whether or not instantiated’) to be instantiated. Consequently it is unclear that, from Plantinga’s (or God’s) viewpoint, the counterfactual is indeed ungrounded.

The third example is put concisely by Sider: ‘the theory that there is a law of nature that *Fs* are *Gs* iff each object in the world has a certain ‘brute’ property *being such that all Fs lawfully must be Gs*.’³⁹⁰ Compare this with the regularity theory, or with the view that the law obtains when a ‘nomic necessitation relation’ holds between relevant objects. The former adds nothing ontologically, the latter adds only a relation between the universals cited by the law (which could, at a simple level, be viewed as something which could be discovered through empirical research).

The fourth example is reminiscent of the ‘spatial tense’ argument against A-theories³⁹¹. Sider asks us to ‘imagine someone who believes only in one point in space, but introduces irreducible “spatial tense operators”, for example NORTH (ϕ).’³⁹² Sider adds nothing to this, but presumably the idea is that such a person wants to talk about ‘not-here’ propositions as true or false, and instead of invoking the existence of more than one spatial location they opt to make spatial tense operators into primitive ‘facts’ about the world.

The final example uses the idea (assessed by Prior) of personal tense operators, such that ‘instead of writing “everyone taller than me is sitting”, one would replace the quantifier over persons with an operator ALL-TALL, resulting in the sentence “ALL-TALL (Sitting)”.’³⁹³ Sider asks us to imagine a solipsist claiming that such operators were primitive: ‘the solipsist claims to reject the existence of all other people but reconstructs what the rest of us regard as talk of other persons using these personal tense operators.’³⁹⁴ This is somewhat clearer than the previous example: the solipsist wishes to engage in speaking about many persons, but instead of grounding the truth of such language in posited extant persons, the solipsist chooses to take as primitive operators which would normally function by referring to such persons.

Sider argues that primitive properties such as *previously containing dinosaurs*, and states of affairs such as *there once existing dinosaurs*, and indeed ‘invoking the tenses themselves as primitive’³⁹⁵, all count as dubious ontologies and versions of ‘cheating’ that fit with the set of examples. He develops this by drawing out the common factor: that in all cases ‘irreducibly *hypothetical* properties are postulated, whereas a proper ontology should invoke only *categorical*, or occurrent, properties and

³⁹⁰ Sider, *Four-Dimensionalism*, p.40

³⁹¹ For example, see Craig, *The Tensed Theory of Time*, p.97ff; Mellor, *Real Time II*, pp.47-53

³⁹² Sider, *Four-Dimensionalism*, p.40

³⁹³ Sider, *Four-Dimensionalism*, p.40

³⁹⁴ Sider, *Four-Dimensionalism*, p.40

³⁹⁵ Sider, *Four-Dimensionalism*, p.41

relations.³⁹⁶ This distinction can be clarified as follows: ‘Categorical properties involve what objects are actually like, whereas hypothetical properties “point beyond” their instances.’³⁹⁷ So Sider’s argument is that the presentist’s properties and states of affairs are attempts to circumvent the demands of those grounding principles for a fuller, better ontology than the presentist can supply. The property of *previously containing dinosaurs* purports to be a part of the world, and invoking it seems to be saying something about the contents of the world – but in fact (since on the presentist view the present is all of the world that exists) it ‘is not a matter of what the world itself is like, but points beyond itself, to the past’³⁹⁸ and therefore to something which *ex hypothesi* does not exist. Sider suggests that, even if one were not to accept the categorical/hypothetical distinction, the presentist position could be characterised as sharing sufficient features of the other ‘dubious ontologies’ to cast doubt over its position.

Analysis of Craig’s Version of Presentism

Craig attempts to construct a version of presentism that uses modal concepts to avoid making ontological commitments to moments other than the present, but which nevertheless avoids the criticisms of presentism/temporal solipsism that I have explored above. This proceeds in three stages: first, he tries to expand standard possible world structures to account for tensed possible worlds; second, he gives his understanding of ontological commitments for standard possible world structures; finally, he translates the previous material into his commitments for tensed possible worlds. In what follows I am not providing a properly formalised argument; rather I have chosen to display the account in three sets of numbered propositions to give the clearest possible analysis and facilitate easy reference.

- 1) A possible world is defined as a maximal possible state of affairs, where a state of affairs S is maximal if, for any S’, S includes or precludes S’.
- 2) Possible worlds and the states of affairs comprising them are normally characterised as tenseless.
- 3) Presentism requires tensed facts.
- 4) Tensed facts require tensed states of affairs to be constituents of possible worlds.

³⁹⁶ Sider, *Four-Dimensionalism*, p.41

³⁹⁷ Sider, *Four-Dimensionalism*, p.41

³⁹⁸ Sider, *Four-Dimensionalism*, p.41

- 5) A tensed possible world is a maximal possible state of affairs at t (a time interval of variable but specified duration).
- 6) Tensed possible worlds which did, do, or will obtain are tensed actual worlds.
- 7) A tensed actual world at t is the tensed actual world which obtains when t is present.
- 8) The world which presently obtains is the tensed actual world.
- 9) Tensed actual worlds constitute the tensed history of the actual world α . They are respectively comprised of all states of affairs entailed by α and each successive t 's being present.
- 10) The schema for tensed history/ies may be generalised to any possible world W .
- 11) Each tenseless possible world exists in each world.
- 12) The actual world α is the maximal state of affairs that obtains (tenselessly).
- 13) If some other possible world β were actual α would not obtain but would still exist as a possible state of affairs.
- 14) Every tenseless possible world W is actual in/at W .
- 15) The actual world α is not only actual in α but also actual *simpliciter*.
- 16) Each tensed possible world exists in each such world.
- 17) The tensed actual world ν is the maximal state of affairs that obtains (present-tense).
- 18) If some other tensed possible world u were actual, then ν would not obtain, but it would still exist as a tensed possible state of affairs.
- 19) If u obtains (present-tense), then either ν does not yet or no longer obtains, but ν nonetheless exists as a tensed actual state of affairs.
- 20) If ν alone is (present-tense) actual, no other tensed actual world is (present-tense) actual. They were or will be actual.
- 21) Every tensed world Wt is actual in/[at] Wt .
- 22) The tensed actual world ν is not only actual in ν but also actual *simpliciter*.³⁹⁹

What account does Craig give of his model of presentism in relation to the five points made by Le Poidevin? Comprehension of Craig's position here is hindered by the fact that, although he starts out by correctly identifying Le Poidevin's points as

³⁹⁹ Close paraphrasing of Craig, *The Tensed Theory of Time*, pp.208-10

claiming to specify ‘objectionable doctrines characteristic of temporal solipsism’⁴⁰⁰, by the end of the discussion they have become simply ‘objections’⁴⁰¹. In line with previous discussion, I shall here concentrate on cross-time relations and truth-makers, but I also provide a preliminary observation on the existential quantifier.

Concerning the range of the existential quantifier, Craig provides two options. In the first place, the presentist could ‘understand the tenseless existential quantifier to take as its range all individuals in α , the tenseless actual world.’ However, ‘the presentist has no reason to deny [a] tenseless truth about x . On the basis of the A-theory of time, he just does not invest tenseless existential quantification with the sort of metaphysical significance [of ineliminable quantification over F ’s leading to realism over F ’s].’⁴⁰² This apparently cavalier attitude to the links between language and ontology is presumably a result of Craig believing that he has demonstrated the ineliminability of tensed facts from language during his earlier critique of B-accounts of language. Nevertheless, it is somewhat questionable to bandy about talk of the ‘tenseless actual world’ in what one can only suppose to be an intended *façon de parler* context, rather than an ontological commitment. Does Craig’s second option fare any better?

Craig allows that a presentist who wanted to maintain that ineliminable quantification over F ’s leads to realism over F ’s would have to commit to a reformation of classical logic, and suggests Smith’s move of making the existential quantifier disjunctively tensed (‘there is, was, or will be some x such that’⁴⁰³) or moving the existential quantifier to fall within the scope of tense operators. We have already seen trouble brewing for this latter tactic in Sider’s consideration of cross-time relations⁴⁰⁴, and it is worth observing in passing – although the debate cannot be taken up in full – that Le Poidevin takes Smith’s view as different from temporal solipsism exactly because ‘he treats all events as equally real in the sense that they are within the domain of quantification’⁴⁰⁵.

Craig’s response to the issue of cross-time relations is deeply problematic. He begins with a sort of *tu quoque* argument to the effect that if we want cross-time relations in the way the B-theorist demands then we should want modal realism too:

⁴⁰⁰ Craig, *The Tensed Theory of Time*, p.208; cf Le Poidevin, *Change, Cause, and Contradiction*, p.36

⁴⁰¹ Craig, *The Tensed Theory of Time*, p.213

⁴⁰² Craig, *The Tensed Theory of Time*, p.210

⁴⁰³ Smith, *Language and Time* (Oxford: Oxford University Press, 1993), p.92. For a more recent attempt at solving the problem of cross-time relations within a non-Priorian presentism, see Craig Bourne, *A Future for Presentism*, p.95ff

⁴⁰⁴ See above p.108f

⁴⁰⁵ Le Poidevin, ‘Introduction’, in Robin Le Poidevin (ed.), *Questions of Time and Tense*, p.7

ruling out cross-time relations on account of the non-reality of one or more relata should also rule out transworld relations unless all the relata are equally real. Meanwhile, any moves that can be made to avoid this in the case of transworld relata will have analogues for presentism: 'for example, my being shorter than my grandfather could be construed as the claim that were my grandfather to exist today, I should be shorter than him.'⁴⁰⁶

This strikes me as odd, since presumably what is doing the work in this example is 'were my grandfather to exist', which is a possible world step and not a tensed one. To put it another way, Craig is not providing a presentist way of succeeding in making cross-temporal relations, he is reducing temporal relata to possible world relata. He can attempt this because, on actualism, all that exists is what exists in this world and, on presentism, all that exists is what exists now: given presentist premises, presentism is tensed actualism. But when I say 'were my grandfather alive today, I should be shorter than him' I don't mean that some possible entity would have a certain relation to me were it actual, I mean to express something about the height of two actual people. This small intuitive point shows that we can drive a wedge between the desires of actualists and presentists.

More carefully developed, the core of our discomfort over Craig's response may well be that possible world theory works by stipulation, whilst reality does not. Even a 'modal realist' such as Lewis would presumably agree that a difference between possible worlds and the actual world is that the actual world has presented itself to our consideration independently of our stipulation of it, whereas we can only consider the contents of possible worlds by stipulating the non-actual states of affairs which we will consider (even if all of the possible worlds are actual at themselves). Thus, to claim that any way out of modal realism for the actualist is a way out of chroral realism for the presentist is precisely to miss the intuitive point on which the argument from cross-time relations is built: that the past is simply not like another possible world. It actually happened.

As Craig develops his response (perhaps to take account of this, although he does not say as much), it becomes more worrying. It is, he reckons, 'rather misleading...to speak of non-contemporaries as simply unreal. For unlike merely possible objects, both of them do exist in the actual world. They are just not real at the same time.'⁴⁰⁷ This begins to sound like the B-theorist, who asserts that all moments

⁴⁰⁶ Craig, *The Tensed Theory of Time*, p.211

⁴⁰⁷ Craig, *The Tensed Theory of Time*, p.211

are equally real but saves the position from incoherence by reminding the critic that this does not mean that they are *simultaneously* extant: each moment exists at that moment, but all moments exist equally.

It strikes me that Craig is here using the intuition cited above to have his cake and eat it: the present is all that exists, but the (tensed) history of the actual world must itself be actual, even if not present. This is what Craig's theory, as expressed in (1-22) above, boils down to: the past and future are modally real and temporally non-extant, and the present is modally real and temporally extant. However, this attempt is not adequate to the task. To show this we must return to (1-22), concentrating on (6, 7, 19 & 20):

- 6) Tensed possible worlds which did, do, or will obtain are tensed actual worlds.
- 7) A tensed actual world at t is the tensed actual world which obtains when t is present.
- 19) If u obtains (present-tense), then either v does not yet or no longer obtains, but v nonetheless exists as a tensed actual state of affairs.
- 20) If v alone is (present-tense) actual, no other tensed actual world is (present-tense) actual. They were or will be actual.

(6) gives us the answer to the question 'What is actual?' from which to begin our analysis of the position that past and future are modally real but temporally non-extant whilst the present is modally real and temporally extant. (7) is consistent with the position, because it is consistent with the importance allocated to the present and does not deny that the future and past are modally real. Vitaly, it does not say anything about what the case is when t is not present. (19 & 20) is where problems begin to occur with respect to this omission. In (19) either v is both temporally extant and actual (modally real) or simply actual but non-present. It is specified that it is either past or future, so by the principle that only what is present exists, it does not exist. Nevertheless it is supposedly actual. By (20), a tensed actual world that is non-present is not present-tense actual but either will be or was actual. So the existing tensed actual state of affairs in (19) neither presently exists, nor therefore exists at all (for the B-option of stating that it does not exist at the moment of consideration but is at that moment real *at its own moment* cannot be taken up), nor is presently actual. Instead, as (7) tells us, it is actual when the t corresponding to it is present. But how does this

make the tensed state of affairs either extant or actual at any time other than that t specified as corresponding to its present? How does it solve the problems of cross-time relations for the presentist without collapsing into the view that all times are temporally real? I submit that it does not. Increasingly, it appears that Craig will have to rely upon assertions of brute distinction between temporal reality and modal reality with respect to non-present times.

Joseph Diekemper follows a related but distinct line of criticism to that which we have considered here when he raises the question of ‘the asymmetry of fixity’; he suggests that Craig will have difficulty (on 1-22 above) explaining the difference between past and future. For Craig the actual past and future are more ‘ontologically robust’ than possible worlds, but it is unclear how Craig can give an account of our intuition that the past is fixed and the future contingent.⁴⁰⁸

The nail in the coffin for Craig’s presentism comes from (5), which we recall is:

- 5) A tensed possible world is a maximal possible state of affairs at t (a time interval of variable but specified duration).

On top of all the difficulties thus far, Craig has to include his escape route from the problem of the instantaneous present, which he considers at a different point in *The Tensed Theory*⁴⁰⁹. This is expressed in the parentheses at the end. In an attempt to avoid problems arising from the question of the duration of the present⁴¹⁰ Craig suggests that the present be understood non-metrically. This means that ‘there need be no...minimum length or temporal duration because space and time are potentially infinitely divisible.’⁴¹¹ Nevertheless, once one metricates time it is clear that there are objective differences in duration (it does not cease to be the case that the Olympics is longer than the German Formula One Grand Prix).

This is fairly unproblematic. Unfortunately for Craig, however, it has the effect that ‘the duration of the present will be as long or as short as the event or thing under discussion’⁴¹²; there is no present *simpliciter*, only present objects, events, states of

⁴⁰⁸ Joseph Diekemper, ‘Presentism and Ontological Symmetry’, *The Australasian Journal of Philosophy* 83:2 (2005), pp.223-40. Diekemper provides extensive discussion of this issue in the wider context of presentist theory.

⁴⁰⁹ Craig, *The Tensed Theory of Time*, pp. 228-248

⁴¹⁰ See Craig, *The Tensed Theory of Time*, pp.228-245. In short, he finds that ‘instantaneous presentism’ succumbs to Zeno’s paradoxes of motion and plurality, and that ‘atomic presentism’ would commit one to an undesirable scientism (this is, however, related to his other commitments in that area).

⁴¹¹ Craig, *The Tensed Theory of Time*, p.246

⁴¹² Craig, *The Tensed Theory of Time*, p.245

affairs and so on. Whenever we metricate, we simply get such statements as ‘The present minute is a duration of one minute.’ This might be considered a perfectly reasonable way of understanding the concept of the present in terms of duration, and undoubtedly provides a common-sense way of getting around bothersome paradoxes: I do not think it is self-evidently wrong. When combined with the metaphysical doctrine of presentism, however, it is disastrous: if only the present exists and we can call anything we like the present (e.g. ‘the present stage of the evolution of the sun’⁴¹³) then how do we go about determining what exists?

Craig says that the ‘present instant’ can be used as a conceptual limit ‘so that there is no minimum temporal interval which is now’⁴¹⁴, but does not address the existential import of his view. He states ‘presentness should be construed as a mode of existence, a temporal as opposed to timeless mode of being.’⁴¹⁵ If we combine this with his concept of the ‘elastic present’ we have two options: either presentness just is temporality, in which case the question of the reality of past and future go unanswered and we are almost back to square one; or, all that exists is what exists now. The latter is what we expect of presentism, but in this case there seems to be no reason why we should not refer to ‘the present universe’. This seems difficult to distinguish from a B-theory of time, for if the present universe exists and can be analysed into past/present/future with the present instant as conceptual limit then our ontology looks decidedly B-theoretical. Craig’s tensed possible world in (5) starts to look like a tenseless possible world, and the model presented in (1-22) is in danger of collapse⁴¹⁶.

Craig has a final stab at resolving cross-time relations for presentists. He provides two options for such relations: first, that relations are ontologically not mind-independent and therefore depend upon the mind of the person making the comparison; secondly that relations are ‘abstract objects that plausibly do not exist in time at all’⁴¹⁷ and are then able to reach across times. The first might be considered questionable as a tactic to be pursued simply to rescue presentism from a problem over cross-time relations: presumably ‘being simultaneous with’ is a relation, and one which (as we shall see in the next chapter) the presentist relies upon to be absolute in order to avoid problems with standard interpretations of relativity theory. What would it mean to

⁴¹³ Craig, *The Tensed Theory of Time*, p.245

⁴¹⁴ Craig, *The Tensed Theory of Time*, p.247

⁴¹⁵ Craig, *The Tensed Theory of Time*, p.246

⁴¹⁶ Paul Helm criticises Craig’s use of an ‘elastic present’ in his review of Craig’s work, and likewise concludes that it endangers Craig’s presentism with collapse into a B-theory. See Paul Helm, ‘Time and Time Again: Two Volumes by William Lane Craig’, *Religious Studies* 38 (2002), pp.489-498

⁴¹⁷ Craig, *The Tensed Theory of Time*, p.212

claim both that simultaneity is absolute and that it is mind-dependent? Mind-dependent relations would, I suggest, be the more natural ontological bedfellow of the standard relativity interpretation, in which what things are simultaneous depends upon the frame of reference involved.

What of the second option? On the face of it, it runs into precisely the problems that an atemporal view of God combined with a tensed view of time ran into in the previous chapter. A relation will have to ‘wait’ between its relata, so it will be temporal (metaphysically, if not physically). But far more damagingly, the first relatum will go out of existence before the second relatum comes into existence: how then could an abstractly existing relation relate them? To adapt from Padgett and use a spatial analogy, the problem with the observer on the hill saying that x is one mile further along the road from y is that only either x or y exist, never both together.

Craig matches his abstract relations option with relational properties for individuals: when Socrates existed, he had a property of ‘going to be referred to by Craig’ or ‘*being referred to by William Craig at t_n* ’⁴¹⁸ and now Craig has the property of ‘referring to Socrates’. The problem with the latter is that on the presentist view there is no Socrates to refer to. Of the two former options, the second is tenseless and implies that t_n exists, but more problematically on an open view of the future (which the presentist is more likely to have than anyone else) Craig does not exist and might not refer to Socrates when he does exist, and so we can only attribute the relational property to Socrates when Craig both exists and refers to Socrates. By then, however, there is (on a presentist account) no Socrates in existence to whom to attribute the relational property.

On the topic of truth-makers for past and future tensed statements, Craig again attempts to exploit his distinction of modal reality and temporal reality. He says:

On the presentist semantics given here, a future-tense statement is true iff there exists some tensed actual world at t in which the present-tense version of the statement is true, where t has not elapsed by the present moment. A past-tense statement is true iff there exists some tensed actual world at t in which the present-tense version of the statement is true, where t has elapsed by the present moment.⁴¹⁹

However, these represent truth conditions and not truth-makers. The truth-makers are simply ‘that reality was or will be as the statements describe’⁴²⁰. Indeed, ‘there are tensed facts corresponding to what tensed statements assert, but past- and future-tense

⁴¹⁸ Craig, *The Tensed Theory of Time*, p.212

⁴¹⁹ Craig, *The Tensed Theory of Time*, p.213

⁴²⁰ Craig, *The Tensed Theory of Time*, p.213

facts exist because of the present-tense facts which did or will exist.’⁴²¹ It appears that Craig’s strategy for getting around such challenges as Sider’s (what does it mean to say that there is a present fact of ‘once containing dinosaurs’?) is to say that tensed facts just refer to other times where the truth-makers will be found. Even putting aside the criticism of Craig’s version of presentism already covered, it is hard to make sense of this as anything other than the assertion that past and future are not part of present reality – which, as Le Poidevin points out⁴²², is really just a trivial truth unless backed up by some more detailed argument. Instead of this, Craig has the following to say in conclusion:

Certainly the grounds of the truth of tensed statements is not present evidence causally connected to the events in question, and there is no reason the presentist should adopt such a verificationist viewpoint.⁴²³

It is mystifying why Craig sees fit to invoke the shade of verificationism at this point. No-one is saying that a tensed statement is meaningless unless we can trace a path to its verifier. Craig already accepts that there must be some state of affairs acting as truth-maker for a tensed statement; the quibble is over whether his presentist account can provide such truth-makers without rendering itself trivial or incoherent, or collapsing into some other theory of time. By accepting also that present states of affairs cannot provide a truth-maker for past-tense statements, he shows that he must rely upon his ‘modally real but temporally non-extant’ understanding of the past and future. Consequently, I suggest that the view Craig espouses is in deep philosophical trouble in respect of issues of language and ontology, and cannot, from the standpoint of those issues, marshal independent metaphysical arguments to counter any scientifically supported claims made by the B-theorist or capitalise on a scientifically level playing field should it occur.

If the view that only the present exists is the best solution to McTaggart’s paradox and the faults found with that view in this chapter are fair then it seems increasingly likely that the issue of the use of science must come to the fore – especially given that Sider chose not to pursue the debate with presentism into the area of revisionary science. The next chapter addresses just this issue.

⁴²¹ Craig, *The Tensed Theory of Time*, p.214

⁴²² Le Poidevin, *Travels in Four Dimensions*, p.140

⁴²³ Craig, *The Tensed Theory of Time*, p.214

Chapter V – The Status of the Present: Science, Philosophy, and Interpretation

Introduction

In the last chapter we saw the difficulty inherent in presentist attempts to provide strong independent metaphysical arguments (centring on language and ontology) for their position. The time has come to remind ourselves of why such independent arguments might be a good idea, and of the structure within which such arguments are considered independent.

The core of Hawley's account in chapter two was essentially that metaphysical beliefs must be empirically adequate but are not directly entailed by empirical data. A 'scientific metaphysics' must be able to show some genuine involvement in scientific theory (or its detractor show that there is no such involvement); an 'alternate metaphysics' must provide empirical and explanatory equivalence (or its detractor show that it cannot do so). More than this, however, the alternate metaphysician will need to provide some independent philosophical arguments: if following an Undermining strategy, they may be able to claim a level scientific playing field first; a Counterargument strategy, on the other hand, admits the support given to scientific metaphysics by scientific theory, but attempts to bring overwhelming philosophical argument in favour of an alternate metaphysic.

What is the situation in the debate over philosophies of time? We need to identify what is to be labelled 'scientific metaphysics' here. Essentially the sort of metaphysical claim we are looking at is 'there is no absolute present' or 'there is no ontologically distinguished past, present and future'. This is found in the negative claim in special relativity theory that there is no preferred frame of reference, which we shall see means that there is no absolute present moment in the universe. The alternate metaphysic here is presentist, and claims that what is present is all that exists and that temporal becoming is real and absolute.

In order to make sense of these two claims within our structure of relating science and metaphysics, we require a sound understanding of the special theory of relativity. Then it will be possible to assess Craig's response to the situation with a view to finding out whether or not he succeeds in avoiding damage to his metaphysics. If he succeeds outright, then it is likely that the defender of divine timelessness will need to address a structure of constraints operating from a level scientific playing field – i.e. a structure of constraints where philosophical arguments independent of science are the most vital to the debate, and where the methodology of relating science and

philosophy espoused in this thesis reveals a foundation of empirical equivalence which can be safely left untouched by the defender of divine timelessness, rather than revealing a possible constraint running through science and philosophy to theology in virtue of restrictions placed on A-theoretical concepts of time.

Special Relativity – Early Development

In classical physics, two strands of development have been mechanics (Galileo and Newton) and then electromagnetism and optics (Maxwell). A thorough understanding of relativity theory depends in part upon seeing how these two have interacted. In the following discussion I rely for referencing primarily on texts by Steve Adams⁴²⁴ and David Bohm⁴²⁵, providing references sparingly to avoid making the text unnecessarily busy. Other sources which may be referred to are readily available.⁴²⁶

Mechanics can be understood as ‘frame relative’ because the same laws apply within a frame of reference (e.g. if you are travelling at a constant speed in a straight line, you will be unable to distinguish this from being stationary with respect to throwing a ball, say). In order to work out how things are for a different frame of reference, one must use transformations which are simple and straightforward: the measured time-value of the second frame will be the same as in the first; the measured velocity of an object in the second frame will be equal to its velocity in the first frame minus the velocity of the second frame relative to the first; the measured position on an axis of an object in the second frame will be its position in the first frame minus the product of second-frame velocity along that axis and duration of travel at that velocity.⁴²⁷ This relativity was obscured on account of Newton’s emphasis on an ‘absolute’ inertial frame in the form of absolute space.

Maxwell’s work identified light as a variety of electromagnetic radiation with a certain speed. Given that electromagnetic radiation was a propagated wave, it made sense to ask through what it was propagated, since sound waves were well known to be propagated through various substances at various speeds. Thus the luminiferous æther

⁴²⁴ Steve Adams, *Special Relativity: An Introduction to Space-time Physics*, pp.1-174

⁴²⁵ David Bohm, *The Special Theory of Relativity* (London: Routledge, 1996), pp.3-55

⁴²⁶ Particularly Albert Einstein, *Relativity: The Special and General Theory* (New York: Henry Holt and Company, 1920), but also, for example, Ulrich E. Schröder, *Special Relativity* (Singapore: World Scientific, 1990), pp.3-58; Yuan Zhong Zhang, *Special Relativity and its Experimental Foundations* (Singapore: World Scientific, 1996)

⁴²⁷ The latter-most can be seen easily in terms of SI units and definitions: a velocity is given in metres per second, and is in a specific direction; consequently, knowing the number of seconds travelled at that velocity will allow us to calculate the change in metres between the measurement of object-position in two frames (and hence two coordinate systems) moving relatively to each other.

was postulated as an all-pervading substance which allowed propagation of electromagnetic radiation. "The electromagnetic field was taken to be a certain kind of stress in the ether, somewhat similar to stresses that occur in ordinary solid, liquid, and gaseous materials that transmit waves of sound and mechanical stress."⁴²⁸

However, this creates the difficulty that Galilean-Newtonian frame-relative mechanics seemingly cannot hold, since Galileo's transformations will mean that light will have various speeds depending upon how fast the observer moves through the ether; Maxwell's equations will then need to be different in relation to Galilean transformations in order to give the different speeds of light, and the laws of electrodynamics will have to have the 'æther frame' as their 'true frame'. The speed of light will work in the same way as the overtaking car example; if we move in the same direction as the light, but slower than it, then we should be able to measure the speed of light as being significantly less than if we were moving in the opposite direction.⁴²⁹

In a bid to resolve this potential block to development in mechanics and electromagnetics/optics, several 'æther theories' were put forward. In particular, the key element was the measurement of the Earth's velocity with respect to the ether; this would obviously be vital, since if the æther represented a privileged rest frame and the core frame for electromagnetism, then discovery of the Earth's motion relative to it would allow us to compute and correct important measurements made in laboratories.

Much of the empirical evidence we have against æther hypotheses derives from astronomical factors, since it is on the largest scales that one might expect to see effects involving the propagation of light. For example, in 1810 François Arago reasoned that in training a telescope on a star, the ratio of the Earth's velocity through the æther to light's velocity through the æther should allow us to calculate the Earth's velocity by measuring the change needed in focus to off-set the change in speed of light caused by the Earth's orbital motion: at some times, the Earth will be moving towards the star, and at some times away, such that light will have a greater or lesser velocity respectively. However, the experiment did not show the expected focus change; "terrestrial telescopes formed images as if the Earth were at rest in the ether."⁴³⁰

A famous experiment in 1887 by Albert Michelson and Edward Morley (building on a previous one by Michelson in 1881) attempted a different method of

⁴²⁸ Bohm, *The Special Theory of Relativity*, p.11

⁴²⁹ cf. Einstein, *Relativity: The Special and General Theory*, p.19-21

⁴³⁰ Adams, *Special Relativity*, p.42

discerning the æther.⁴³¹ A system of mirrors was set up so that two light beams travel perpendicularly to one another and are then combined so as to produce an interference pattern (bright/shadow striping). If light is propagated through æther, then one beam will travel more slowly overall than the other beam, since one beam will be slowed by having to propagate directly against the flow of the ‘æther wind’ caused by the Earth’s movement through the æther. The idea of the experiment is that if the whole apparatus is rotated slowly through 90 degrees, then at some point one of the beams will be subject to the slowing and at some perpendicular point the other beam will be subject to the slowing. Because the beams combine at the end of their journey to produce interference fringes and the effects of light interference are very pronounced from small changes, a shift in the pattern of interference should be seen and when measured can be used to calculate the speed of the æther wind and thereby Earth’s velocity through the ether. However, no shift in the interference patterns takes place.

Both Arago’s experiment and the Michelson-Morley experiment imply that the Earth is at rest in the æther. This is problematic because, at the most basic level, it potentially puts us back to pre-Copernican times, trying to work out how the sun (etc.) can be orbiting the Earth⁴³². It is also problematic because it seems to be at odds with the phenomena of stellar aberration⁴³³: if the Earth is at rest with respect to the æther then it is difficult to explain why we need to make small telescope adjustments to see the stars at different times during what was assumed to be our orbital motion.

One attempt made to rescue the æther hypothesis was to posit an ‘æther drag’ around objects, including the Earth, so that a layer of æther would be carried with it and we would therefore be unable to measure any æther flow within the Earth’s

⁴³¹ A. A. Michelson and E. W. Morley, ‘On the Relative Motion of the Earth and the Luminiferous Aether’, *Philosophical Magazine* S. 5, 24:151 (1887), p.449-463; A. A. Michelson, ‘The Relative Motion of the Earth and the Luminiferous Aether’, *American Journal of Science* S. 3, 22 (1881), p.120-129

⁴³² Something which we have independent empirical astronomical reasons to deny, since a pre-Copernican model would give rise to stellar parallax, which is not observed despite attempts by, for example, James Bradley in 1727 (for more detailed discussion see, for instance, J. D. Fernie, ‘The Historical Search for Stellar Parallax’, *Journal for the Royal Astronomical Society of Canada* 69 (1975), p.222-239). It is notable that it was Bradley’s search for stellar parallax which uncovered the phenomenon of stellar aberration.

⁴³³ Given the speed at which the Earth moves through its orbit, in order to train a telescope on distant stars, we need to make a small adjustment and the star will appear slightly to one side or the other of its position as measured (*per impossible*) by a stationary Earth, depending upon which part of the Earth’s orbit we are currently moving through. An analogy would be as follows: If rain is falling straight down then the faster we move, the more we have to angle our umbrellas to stay dry. If we walk slowly, we can get away with holding the umbrella straight up, but if we run then we have to tilt it forward or risk a drenching.

atmosphere.⁴³⁴ Consequently, to test æther drag Oliver Lodge passed beams of light close to spinning disks, attempting to observe changes in the light which would be present if the disks dragged layers of æther with their motion (remember, æther is what allows light to propagate, in the same way that air or some substance is required for sound and changes sound if it moves or the substance alters). However, no changes could be observed.⁴³⁵

The analysis of stellar aberration can also be seen to pose problems for the hypothesis of æther drag around the Earth. Bohm uses the analogy of sound waves from a distant source reaching a train. Remembering that light waves were thought to propagate through the æther in a similar way to that in which sound waves propagate through substances (air etc.), we note that the train – obviously – carries substance with it as it moves, and if the sound waves strike the side of the train parallel to that side, then the waves will propagate through the train in the same direction (with only a speed change resulting from the different substances), and this independent of the train's speed. Similarly, light waves incident upon a moving area of æther would cause parallel wave propagation within the moving æther, so that the waves reaching the telescope would not produce stellar aberration. Another analogy might be that if rain was produced equally through all points in the air, instead of falling from clouds, and if we carried a large section of air with us when we moved, rather than moving *through* the air, then we would be able to hold our umbrellas vertically at all times, instead of having to tilt them, because the source of the rain (the air) would be moving at the same rate that we moved. The phenomenon of stellar aberration and the null result of experiments such as Lodge's seem to rule out æther drag.

Leaving behind the hypothesis of æther drag, another hypothesis can be put forward: perhaps the speed of light is not determined relative to the æther which propagates it, but relative to the source of the light. However, astronomical observation of binary stars leads us to reject such an hypothesis.⁴³⁶ Binary stars are two separate stars which orbit about a common centre of gravity and which are therefore (relatively) close to one another. It should be clear that when observing such stars through a telescope parallel to their orbital paths, at some moments one star will be moving

⁴³⁴ For a recent discussion of Arago's experiment in connection with the æther drag hypothesis to which it gave rise, see Rafael Ferraro and Daniel M. Sforza, 'Arago (1810): the first experimental result against the ether', *European Journal of Physics* 26 (2005), p.195-204

⁴³⁵ See, for example, Oliver Lodge, 'Aberration Problems: A Discussion concerning the Motion of the Ether near the Earth, and concerning the Connexion between Ether and Gross Matter; with Some New Experiments', *Philosophical Transactions of the Royal Society of London A*, 184 (1893), p. 727-804

⁴³⁶ See for example, Kenneth Brecher, 'Is the speed of light independent of the velocity of the source?', *Physics Review Letters* 39:17 (1977), p.1051-1054

toward the viewer rapidly and the other star moving away similarly rapidly, and that at other moments when the orbit has gone through 180° the situation will be reversed. Consequently, by observing the binary system over time we ought to be able to see the difference in light intensity resulting from the emission of light with added velocity in one case and decreased velocity in the other case, and then vice versa as the stars orbit. However, no intensity variation occurs and we must conclude, on the basis of the relevant calculations, that the light-source-relative speed of light must be given up as an hypothesis.

Heinrich Lorentz began from the assumption of the æther, and then worked with Newtonian and Maxwellian physics to develop a new solution to the problems outlined above. His starting point was to work on the relationship between matter's structure and its movement through the æther. "Lorentz assumed that the electrical forces were in essence states of stress and strain in the ether. From Maxwell's equations (assumed to hold in the reference frame in which the ether was at rest) it was possible to calculate the electromagnetic field surrounding a charged particle."⁴³⁷ By making a different calculation for this field on the basis of a charge moving through the æther, one discovers that the field changes from spherical to elliptical, the ellipse being in the direction of motion. Since the structure of material objects is such as to be directly related to the behaviour of their constituent elements, the result is that there will be a length contraction of the entire object in the direction of motion. Bohm provides a concise explanation of where this gets us:

Let us now return to the Michelson-Morley experiment. Since the arms of the interferometer are composed of atoms, we expect them to undergo the same shift as that given by $[l=l_0\sqrt{1-(v^2/c^2)}]$ ⁴³⁸. However, only the bar whose length is parallel to the direction of movement will be shortened; the other will not be changed in length.⁴³⁹

The result of this is that the Michelson-Morley experiment is predicted to come out negative, since the Lorentz contraction counters the expected speed change precisely. This result is independent of the velocity of the Earth through the æther.

The above is only the first step. By parallel yet more complicated reasoning and calculation, we can work out that the mass of a particle moving through the æther is greater than that of a particle at rest in the æther. A consequence of all this is that

⁴³⁷ Bohm, *The Special Theory of Relativity*, p.24

⁴³⁸ Where l is the length in the moving frame, l_0 is the length in the rest frame, v is the velocity of the object/system, and c is the speed of light.

⁴³⁹ Bohm, *The Special Theory of Relativity*, p.25

clocks which move through the æther slow down. Again, Bohm provides a concise account:

Now the person who is moving with the laboratory is also constituted of atoms. Therefore, his body will be shortened in the same ratio as his rulers, so that he will not realise that there has been a change. Likewise, his physical-chemical processes will slow down in the same ratio as do his clocks. Presumably his mental processes will slow down in an equal ratio, so that he will not see that his clocks have altered. He will therefore attribute to his rulers the same length, l_0 , that they would have if they were at rest in the ether, and likewise he will attribute the same period, T_0 , to his clocks. In interpreting his experimental results, we must therefore take this into account.⁴⁴⁰

The upshot of this is that experiments such as the Michelson-Morley, designed to measure the speed of light with a view to calculating the speed of the Earth through the æther, which use length and/or time elements, will not work. This is because the length contraction and clock slowing will combine in the experiment to give a result independent of the speed of the Earth through the æther. ‘Yet it is evident that this speed plays an essential role in the Lorentz theory. For, without knowing it, we cannot correct our rulers and clocks to find out how to measure the “true length” and the “true time,” which would be indicated by rulers and clocks at rest relative to the ether.’⁴⁴¹

Bohm asks us to consider a more straightforward method of measuring the speed of light and discovering the speed of the Earth through the æther. If we could synchronise two clocks at a distance and send a light signal from one to the other, we could time it and discover the relevant information. The difficulty is clearly synchronisation; we cannot use electromagnetic waves, because we are trying to measure the speed of these (so if we synchronise using them, we will get a time of zero when we try to measure the speed of light). However, we could simply put two clocks side by side, start them going together and check they were running at the same rate, and then we could separate them slowly to ensure no jarring or other disturbances. Unfortunately, it transpires that if the laboratory is moving through the æther then the clock that moves will go out of phase with the clock that stays by an amount proportional to the distance separated and the speed of the lab through the æther; if they are brought back together, the clocks will come back into phase. The result is that the laboratory observer ‘who does not realise the existence of this phase shift, will call two events simultaneous when his two clocks *A* and *B* give the same readings. Thus, he will

⁴⁴⁰ Bohm, *The Special Theory of Relativity*, p.29

⁴⁴¹ Bohm, *The Special Theory of Relativity*, p.31

make a mistake about what is simultaneous and what is not.’⁴⁴² If we calculate the corrections which must be made to account for the effects of clock slowing and failure of simultaneity, and then plug this into the experiment attempting to find the speed of light by timing the signal from *A* to *B*, we find that the resulting equation tells us that ‘the moving observer will always obtain the same *measured* velocity for light... independent of his speed through the ether.’⁴⁴³

In fact, it can be shown⁴⁴⁴ that no experiment can be constructed which will discover the speed of the Earth through the æther through results dependent upon this speed. Indeed, ‘because of the changes of rulers and clocks resulting from the motion through the ether, the Lorentz theory implies that *all uniformly moving observers will ascribe the same velocity *C* to light, independent of their speed of motion through the ether.*’⁴⁴⁵ This gives rise to major difficulties, as Bohm describes with great clarity:

Nevertheless, this [Lorentz] theory formulates all its laws and equations in terms of “true” distances and times, measured by rulers and clocks that are supposed to be at rest in the ether. Therefore, the measured distances ought to be corrected, to take into account the effect of the movement of the instruments before we can know what they really mean. But if the Lorentz theory is right, there can be no way thus to correct observed distances and times. The “true” distances and times are therefore inherently ambiguous, because they drop out of all observable relationships that can be found in actual measurements and experiments.

What then can be the status of these “true” distances and times that are supposed to be measured by rulers and clocks at rest in the ether? If we recall that the ether is in any case a purely hypothetical entity, not proved on the basis of any other independent evidence, the problem becomes even sharper. Do these “true” distances and times really mean anything at all?⁴⁴⁶

In other words, we cannot translate our measurements into proper measurements because we cannot discover the speed of the Earth through the æther, and we cannot discover that speed because every time we try to allow for travelling at speed through the æther in our experimental set-up for measuring the speed of light, all the terms for the speed of the Earth through the æther drop out of the equations, leaving us with our experimental distances and times, and ‘the’ speed of light.

⁴⁴² Bohm, *The Special Theory of Relativity*, p.34

⁴⁴³ Bohm, *The Special Theory of Relativity*, p.35

⁴⁴⁴ Bohm, *The Special Theory of Relativity*, p.36-38

⁴⁴⁵ Bohm, *The Special Theory of Relativity*, p.39

⁴⁴⁶ Bohm, *The Special Theory of Relativity*, p.40-41

Einstein's Development of Relativity

Einstein considered the problem from a very different angle. He took the Galilean and Newtonian basis that the laws of mechanics are the same in all inertial frames, and extended this to the laws of electromagnetism. Consequently, relativity is founded on the position that the laws of physics work in the same way in all inertial frames. The speed of light thus becomes a constant: since it arises from the laws of electromagnetism, which are the same in every frame, the speed of light must be the same in every frame. This contrasts with the Lorentzian approach, where the laws of electromagnetism are 'right' in the æther rest frame and must be corrected for in all other frames.

This resolves the Michelson-Morley experiment: light speed is constant in all frames and all directions, so naturally no experiment will register a variation. We do get the Lorentz transformations and their effects, but this time as a result of the speed of light being constant and the physical laws being the same in all inertial reference frames, rather than the constant speed of light being a result of instrumental changes with respect to the hypothetical æther.

Bohm outlines the differences between Einstein and Lorentz by use of an example case. He asks us to consider astronauts landing on Mars and trying to contact us here on Earth. 'Suppose that a man on the Earth asks his friend on Mars what is happening "now". Because of the time needed for the signals to reach Mars and the signals from Mars to come to the Earth, the reply will not come for ten minutes or more.... So we will not know what is happening "now" on Mars.'⁴⁴⁷

However, as Bohm points out, we might try to find out when the event reported did in fact happen on Mars. We might use image signals and have the astronaut carry a synchronised clock so that we can see when he is sending his message to us. 'But, according to the Lorentz theory, this clock would measure time differently to the one on the Earth, and be out of synchronism with the one on the Earth by $(l_0 v/c^2)/\sqrt{1-(v^2/c^2)}$, where l_0 is the distance to Mars and v is the velocity of the clock relative to the ether. Since v is unknown, the "true" time of this event on Mars would, for us, be ambiguous.'⁴⁴⁸ We might try to make a direct correction on the time interval for light to reach us, to get around the problem caused by the astronaut having a clock display on Mars. 'But to make the right correction, we should have, according to the Lorentz

⁴⁴⁷ Bohm, *The Special Theory of Relativity*, p.53

⁴⁴⁸ Bohm, *The Special Theory of Relativity*, p.53

theory, to know the “true” distance l [i.e. not l_0 this time], as well as the true velocity v , of the Earth *relative* to the ether to yield the correction.... Once again, we encounter essentially the same ambiguity in the attempt to find out precisely when an event happens on Mars.⁴⁴⁹

In short, our intuitive notions of space and time, and our perception of them, is challenged in such a way that we can no longer relate what we experience to the way the world in fact is. The problem with the original Lorentz theory is that it tells us this very clearly without giving us a way to deal with it (at least, not a way that can be used, since it depends upon knowing information that cannot be known – our speed relative to the æther). The solution which Einstein offers is to remove an assumption of how the world is, and to choose that assumption which is weakest, which does not fit with other things we could say about how the world is. Thus, he asks what would happen if all physical laws were the same in all inertial frames, instead of just the Galilean/Newtonian laws being the same. One consequence is that light would be seen to travel at the same velocity in all inertial frames - this explains the Michelson-Morley experiment, and others – but it requires us to give up our assumption that light behaves similarly to sound and medium-sized dry goods. However, there are other consequences which must be explored.

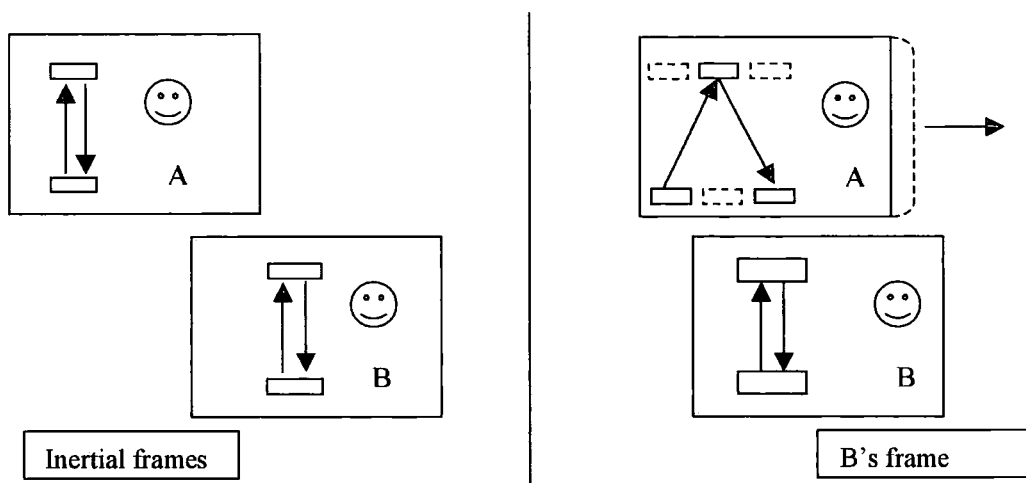
There are three main consequences of the inertial-frame-homogeneity of physical laws and the constant speed of light. The first is time dilation (‘moving clocks run slow’); the second is length contraction, and the third is relativity of simultaneity. I shall explain each in turn.

It is vital to remember that any frame of reference, provided it is an inertial frame, can be used as the frame at rest and other frames will be in motion relative to the selected rest frame. As long as we treat the frames consistently, we can change the rest frame and calculate the relative data for the new case. There is no preferred frame of reference independent of our choice.

Let us take an example from Adams, where we have two labs moving past one another at speed, both constituting an inertial frame. Either can be taken as the rest frame. Each contains one person with a light clock. A light clock consists of two fixed mirrors with a beam of light bouncing between them. Since the speed of light is constant, the time for a bounce cycle will be constant for all observers in that clock’s inertial frame, and because all observers in all inertial frames know the speed of light, if all observers use light clocks they can calculate the relationships between the different

⁴⁴⁹ Bohm, *The Special Theory of Relativity*, p.53

inertial frames more easily. In this case, one observer's lab will constitute the rest frame; thus, the other lab-frame will be moving at constant velocity relative to the rest lab. Thus:

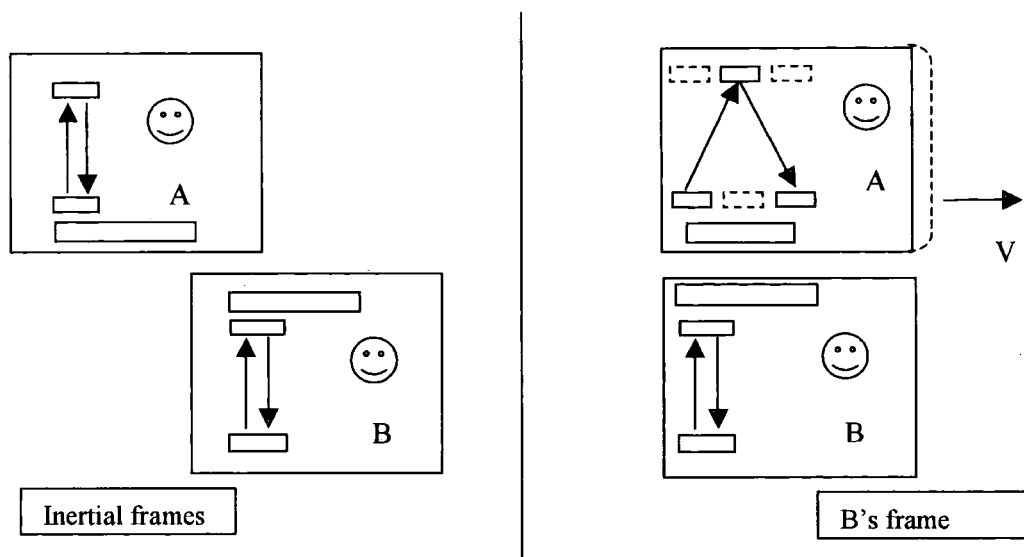


In the first instance, we see what A and B see of their own inertial frames; in the second instance we see only what B sees of B's inertial frame and A's inertial frame. A's frame is moving with respect to B; because A's mirrors are moving, the light will have further to travel in each bounce (a diagonal, rather than a vertical; the original distance plus a bit to account for the motion), but *the speed of light is the same*; it does not have the speed of the lab *in addition to* the speed of light. Consequently, it will take slightly longer for the light to complete a bounce cycle, and consequently, B reasons, A's clock is running slow. But of course everything in A's reference frame is running at the same rate, so B's observation will be that time is passing more slowly in A's frame than in B's; the light clocks simply allow B to make calculations about this.

The difficulty is that from A's position, taking A's frame as the rest frame, B's lab is moving past (right-to-left) at the same speed as A's left-to-right motion in B's observation. Consequently, A will see the same effects in B's frame, but in the opposite direction (i.e. the light bounce paths will extend right-to-left on the diagram). The upshot is that clocks in moving frames run slow compared to clocks in rest frames. Is there a paradox, if A's clock runs slower than B's and B's clock runs slower than A's? No, because A and B are each seeing something different. Adams and Bohm both cite similar analogies in different ways⁴⁵⁰: when you move away from someone they appear smaller and smaller the further you go; to them, you too appear smaller and smaller the greater the distance between you. It is not as if one expects one of the observers to see the other get larger and larger as the distance grows.

⁴⁵⁰ Adams, *Special Relativity*, p.53-4; Bohm, *The Special Theory of Relativity*, p.65

Length contraction follows in a similar fashion.



A and B plan to measure the lengths of their rulers by timing how long it takes to move from one end to the other at a set velocity V , using the highly accurate light clocks. B can see that the light paths are longer for A because A is in motion; consequently, B will reason that when A measures the length of B's ruler by timing A's motion from one end to the other, A will think that less time has passed than actually has, as B sees it (because A's light clock is running slow). So B will time a longer interval on B's clock for A to move from one end of B's ruler to the other than A will time on A's clock. So A will measure B's ruler to be shorter than B measures B's ruler to be. Now, in A's frame of reference, the positions are reversed, so A reasons that B's clock is running slow and that B will measure A's ruler to be shorter than A measures it to be. Consequently, each person will believe that they have the longer ruler and that the other person has mis-calculated because their clock runs slow.

Length contraction and time dilation can both be seen to follow from the comparison of 'frames considered in motion' with 'frames considered at rest'. The nature of the relativistic physics is to define what is invariant and what is relative, and its insight is that motion is the determining factor. Since speed is a relation between 'space covered' and 'time covered', we should expect that the invariant and the relative should be tied up with these two categories.

Adams provides a number of practical examples, the most useful of which concerns muons. These are elementary particles formed in high-energy interactions, either experimentally or naturally. The most useful instance of the latter is when large

quantities are produced in the upper atmosphere (~60km altitude) as a result of interaction between gas nuclei and cosmic rays. Muons are subject to decay, with a half-life of about one and a half micro-seconds. They travel at slightly under light-speed, so they could be expected to take about two hundred micro-seconds to reach the Earth's surface, which means that by the time they reached a sea-level laboratory we would be unlikely to detect any, the great majority having decayed. In fact, we detect plenty – about an eighth of the high-altitude flux. Thus, we may calculate that only three half-lives have passed – about four and a half micro-seconds – in the muon reference frame. This works with the relevant equations to display a time dilation such that time passes in the muon frame 'at 3/133 or a little over 2% of the rate at which it passes on Earth.'⁴⁵¹ Extensive experiments have confirmed various elements of these calculations.

In the muon frame of reference, four and a half micro-seconds of travel at approaching light-speed covers 1.35 kilometres. Clearly this is nowhere near the sixty kilometre depth of the atmosphere, and yet the muons cover the distance. This is where length contraction comes in: the atmosphere is only 1.35 kilometres deep for a muon travelling at near light-speed, as the calculations once again demonstrate. 'You could imagine an observer in the muon reference frame to carry a 1 km measuring rod that he uses to measure the lengths of similar rods placed vertically in the atmosphere. Since about 60 of these rods stretch from sea-level to the top of the atmosphere the muon observer concludes that they are all much shorter than his own measuring rod which fits only 1.35 times into the same distance... (Remember, according to this observer his rod is at rest and the atmosphere and its measuring rods are in high speed motion).'⁴⁵² Thus, from the example of muons, we can see the reality of the relativistic theory's descriptions of how the world works.

The final, and perhaps most important, part is the relativity of simultaneity. Adams asks us to consider two clocks being set to zero but not started; they are then separated by some distance and a flashlight is placed halfway between them. The clocks are constructed to start when the light from the flashlight reaches them. Since they are all in the same frame of reference, the flashlight will successfully cause the two clocks to keep simultaneous time. 'in principle this process could be extended without limit until a uniform time frame was established throughout the universe.'⁴⁵³ Surely this would enable us to discover which events were simultaneous with other events, instead

⁴⁵¹ Adams, *Special Relativity*, p.59

⁴⁵² Adams, *Special Relativity*, p.63-4

⁴⁵³ Adams, *Special Relativity*, p.68

of having all the difficulties of calculating times, light speeds, relative motion and so on? Well, yes, but only if everything is in the same reference frame (and, since things move relative to other things, this is not the case). What will happen in the case of an observer or event moving with respect to the synchronised clocks? Supposing A synchronises two clocks using the flashlight method, and B is moving relative to A's frame of reference, B will experience three effects.

First of all she will disagree about the separation of A's clocks. This is length contraction but will have no effect on her judgement of whether the clocks are synchronised since she agrees that A has placed the flashlight at the mid-point between the two clocks. B will also see A's clocks run slow due to time dilation, but once again this will have no direct effect on the judgement of synchronization, since it affects both clocks equally (it will, however, affect her judgement of synchronisation error...). However, when light leaves the flashlight it will travel at velocity c in all directions relative to B (just as it does for A). If B moves to the right then she will see light travelling in this direction heading toward an *approaching* clock whilst that heading to the left will be chasing a clock which *moves away* from it at velocity v . Although light was emitted from a central point, B will see it arrive at the right hand clock *before* it reaches the left hand clock and conclude that the clocks are not synchronised. It is clear from this argument that the synchronisation error will become greater if the clock separation or the relative velocity of A and B is increased.⁴⁵⁴

Thus, simultaneity is relativised for observers and events in moving frames of reference. Consequently, returning to the idea of the network of synchronised clocks across the universe, if two events occur near two different clocks and are judged by the clocks to be simultaneous, an observer moving approximately 'left to right' with respect to parallel events would say that the event to the right occurred first, whereas an observer moving 'right to left' would proclaim that the event to the left occurred first. Vitaly, 'All three judgements are equally valid. The statement that two events are simultaneous only applies to a particular inertial reference frame.'⁴⁵⁵ This is of course very difficult to get one's head around, because we intuitively want to make one frame a preferred, or rest, frame - and normally this is the frame in which we are at rest. However, we might also want to see some point in the universe as the rest frame point - the sun, the centre of the galaxy, or some posited mid-point - and this similarly fails, since all frames are equally able to be considered 'at rest' or 'in motion' with respect to other frames, and the laws of physics are the same in all of them.

In conclusion to the description of the development of the physical concepts of relativity, then, Einstein's theory completes what was begun by Galileo and Newton, in formulating an account of the world in which the laws of mechanics and

⁴⁵⁴ Adams, *Special Relativity*, p.69-70

⁴⁵⁵ Adams, *Special Relativity*, p.71

electromagnetics are invariant within inertial frames. The surprising elements of his theory – time dilation, length contraction, relative simultaneity – flow from this position and the resulting constant speed of light. Time dilation and length contraction occur also in Lorentz's theory, but in its earlier form (with FitzGerald) this was 'offered as an ad hoc explanation of the Michelson-Morley result'⁴⁵⁶. We shall shortly turn to the later, neo-Lorentzian, defence of a privileged frame of reference, but here it is sufficient to note that thus far the ambiguities engendered by the Lorentzian theory and our inherent incapacity to calculate an object's speed with reference to the æther, which arises on account of its dilation and contraction effects, appear to be in marked comparison to Einstein's theory, which seems to help us calculate and understand more about the universe, at the cost of some of our intuitions about how things ought to work.

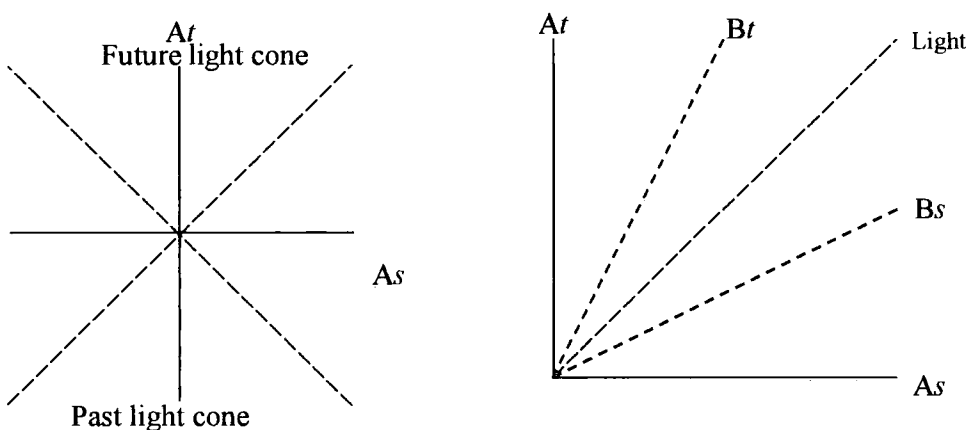
Minkowski's Development of Einstein's Relativity

The advance of Minkowski was to construct a geometrical version of Einsteinian relativity, using Einstein's postulates and geometrical relationships. One key element is the capacity to display states of affairs visually by using a space-time diagram, wherein time is plotted as the vertical axis and space as the horizontal. We are able to convert three spatial dimensions into a single axis because, in most cases, what we are interested in is the spatial separation between two objects over time, and since we are restricting ourselves to uniform motion this separation can be plotted as a straight line on a single axis representing the relative motion along a line. The space-time geometry is possible because we are working from the postulate that the laws of physics are invariant across inertial reference frames: thus, we can represent differing reference frames using the same geometric structure. In the same way that Newtonian/Galilean transformations (from one reference frame to another) could be represented by rotation of a set of axes, so the Lorentz group of transformations can be represented by a different rotation of a set of axes. Importantly, it is possible to derive the Lorentz equations and also the three relativistic effects (time dilation, length contraction, relative simultaneity) from the geometric construction, which uses only the postulates of Einstein's relativity.

Let us take a quick look at how this works. In the first diagram below, we have a space time diagram where the origin is a selected point in space-time. We then plot

⁴⁵⁶ Adams, *Special Relativity*, p.66; cp Elie Zahar, 'Why Did Einstein's Programme Supersede Lorentz's?', *The British Journal for the Philosophy of Science* 24:2 (1973), pp.95-123, which emphasises that the development of Lorentz's research more fully considered does not warrant the label 'ad hoc' on relevant understandings of that term.

the fastest signal possible (a light ray) as a set of lines demarcating, in the top half, the future spatial separation possible at light speed as time progresses and, in the bottom half, the possible spatial separation from which light could have arrived at the origin at the considered moment. This divides the diagram into 'light cones', also tagged 'absolute future' and 'absolute past' respectively of the origin point. Sets of events plotted within light cones represent possible causal linkage to the point of origin ('timelike separation'); sets of events plotted outside the light cones represent events with no possible causal linkage to the point of origin ('spacelike separation').



In the second diagram, we note that our axes are constructed so that light is represented as a line at 45 degrees (this being equivalent to the top-right quadrant of the first diagram). This also acts as a line of symmetry which enables us to construct other reference frames within the one we have chosen as 'at rest'. We can do this because we know that the speed of light is constant in all reference frames: thus, when we construct a new reference frame, it will *not* be the case that the angle of the light-line is different, and so we can use it to relate the new frame to the original frame. As Adams notes, 'an observer's self-experience is of staying put but ageing'⁴⁵⁷, such that to plot the path of an observer, moving relative to the original in another inertial frame of reference, on our axes is equivalent to plotting the time-axis of the observer in that inertial frame. All that is then required to complete the addition of the second frame of reference is that observer's space axis, which will tell us how spatio-temporal separations translate for the observer on the new time axis. Since our postulate is that the laws of physics are

⁴⁵⁷ Adams, *Special Relativity*, p.140

invariant across inertial frames, and the constant speed of light is a correlate of this – hence the light line at 45 degrees – the geometrical representation of the space axis places it at the same angle towards the light line from horizontal as the new time axis was from vertical.

We can use geometrical calculations to find out how points and lines in one reference frame relate to others, and these take the form of the Lorentz transformations and provide us with the same effects of time dilation, length contraction and relative simultaneity as we obtained from the original non-geometrical approach.

The most important element for current purposes is relative simultaneity, and this is probably also the most straightforward to see. Taking the second diagram above as our basis, we can see that lines of simultaneity for A will be parallel to the space axis. In other words, every value on the time axis will correspond to a space-axis-parallel line (called a hyperplane of simultaneity). This makes sense, and is just as it would be in a ‘classical’ diagram of time against space. However, here we are adding in B’s reference frame from A’s viewpoint. Remembering that from B’s viewpoint B’s space-time axes look like A’s do to A (i.e. forming a 90 degree angle) and that B’s lines of simultaneity work on the same basis as A’s, this means that B’s lines of simultaneity are parallel with B’s space axis. The upshot is that the set of points which A and B each consider ‘simultaneous with me but spatially separated’ will clearly differ, and more acutely the closer B is to light-speed.

We can see more clearly through Minkowski space-time the restrictions and surprises inherent in relativity physics. For example, all observers must agree on the temporal sequence of events within the successive light cones of those events. So if C is within the light cone of B and B likewise of A, then all observers will agree that B follows A and C follows B (note that if an event C is within B’s light cone, and B is within A’s light cone, then C is automatically within A’s light cone because the angle involved is always 45 degrees). However, for events outside of each other’s light cones, observers will disagree about the sequence, this depending upon the motion of the observer.

It is important to note that a space-time diagram of either of the above varieties are not ‘absolute’ representations of the universe. In particular, each individual diagram represents a viewpoint from one frame of reference. Although as we have seen other reference frames can be added, they are as those reference frames are from the viewpoint of the selected frame – a separate diagram could be constructed for the other reference frame in which its axes would be the vertical/horizontal and other reference

frames represented as angled. This flexibility is another reason why Minkowski space-time geometry is such a powerful tool.

It should be noted that, even before the critics of presentism and the neo-Lorentzian theory are given the opportunity to state their case, we can see on the basis of the above that a concept of presentism is likely to be in trouble when compared with Einsteinian relativity. For if simultaneity is relative to frame of reference, and there is no privileged frame, then there can be no absolute temporal sequence. It is not simply that our clocks – our measuring instruments for time – will disagree, in the way that my clock here disagrees with my cousin's clock on America's eastern seaboard (for this could be corrected by addition or subtraction when he or I travel to visit each other). Nor is it simply that we must make a transformation calculation to discover the order of events in their rest frame (if they have one in common), although we can do this. It is rather that the order of events in their rest frame – which, if relevantly related according to light-cones, will be absolute – does not tell us about an absolute order of events throughout the universe, because that rest frame is one among many frames, all of which could be treated as the rest frame if chosen. Since observers in other frames may allocate a different order of events, and since their allocation is equally valid as a contender for 'absolute time sequence', it is impossible to say that there is an absolute time and an absolute sequence into which *all* events in the universe can be ordered. Thus, presentism, which contends that only the present exists, is potentially in trouble since 'now' is a frame-relative concept which does not extend uniformly throughout the universe.

Critique of Presentism and Relativity Theory – Methodological Considerations

Let us return to Hawley for her own comments on this topic. She succinctly notes that there are three options for the presentist⁴⁵⁸: first, to reject presentism, on the grounds that presentness is frame-dependent on STR and existence cannot be frame-dependent; second, to accept that existence is frame-dependent; finally, to argue in favour of a privileged reference frame that STR has somehow missed and which will allow an absolute present, thus avoiding frame-relative existence. Few people would want to countenance the second option⁴⁵⁹ and the first option means giving up

⁴⁵⁸ Hawley, 'Science as a Guide to Metaphysics', p.461-462

⁴⁵⁹ For an approximation to the position, see Mauro Dorato, *Time and Reality: Spacetime Physics and the Objectivity of Temporal Becoming* (Bologna: CLUEB Press, 1995). Craig Callender comments that Dorato's position nevertheless characterises tenses 'as relations among events on a 4-manifold and not as

presentism, so it is the third option that holds our interest as the most likely battleground. For an extensive and detailed demonstration of the incompatibility of presentism with Minkowskian relativity *assuming no scientifically revisionary account* of relativity, see Sider's *Four-Dimensionalism*, which canvasses five separate presentist options and provides reasons for rejecting them all.⁴⁶⁰

By way of beginning her brief discussion, Hawley comments on the broad picture:

Defenders of the compatibility of presentism and STR ... argue that to suppose the existence of some privileged frame is merely to go beyond STR. Presentism supplements STR without attempting to supplant it; balking at this is supposedly the mark of outmoded verificationism.⁴⁶¹

The question is clear for her: 'STR achieves a great deal of empirical success without positing an absolute frame of reference. This doesn't entail that there is no absolute frame of reference, but does it make it unreasonable to think that there is such a frame?'⁴⁶² Using the structure she has developed, the issue falls into three parts. The first is to achieve empirical adequacy, the second is to canvass options for Undermining, and the third is to assess the plausibility of Counterargument.

The first part is easily managed by claiming that the preferred frame is undetectable (i.e. something like the Lorentzian æther model) or tenuously linked to some empirical phenomenon. DeWeese, for instance, suggests a small anisotropy in the cosmic background radiation which would be sufficient to locate a position in the universe with respect to which the rest of the universe was expanding isotropically.⁴⁶³ There is still plenty of debate over what this axis – tagged 'the axis of evil' – consists in and whether there are other factors, such as local conditions, which are contributory for the phenomenon. Land and Magueijo have observed that

There are two possible fault lines in the analysis leading to the 'AoE' effect. The first concerns the integrity of the data itself, that is, contamination from noise, systematics and foregrounds. A comparison between the first-year (WMAP1) and third-year

genuine changes in existence.' See Craig Callender, 'Review of Mauro Dorato *Time and Reality: Spacetime Physics and the Objectivity of Temporal Becoming*', *The British Journal for the Philosophy of Science* 48:1 (Mar. 1997), p.119

⁴⁶⁰ Sider, *Four-Dimensionalism*, pp.43-52; cf earlier versions of some arguments in Mellor, 'Special Relativity and Present Truth', *Analysis* 34 (1973-4), pp.74-77

⁴⁶¹ Hawley, 'Science as a Guide to Metaphysics', p.462

⁴⁶² Hawley, 'Science as a Guide to Metaphysics', p.462

⁴⁶³ DeWeese, *God and the Nature of Time*, p.73-74, citing William Lane Craig & Quentin Smith, *Theism, Atheism, and Big Bang Cosmology* (Oxford: Clarendon Press, 1993), p.71, Paul Davies, *About Time: Einstein's Unfinished Revolution* (New York: Simon and Schuster, 1995), pp.128-9 & a web-link which is currently dead – see below for alternative.

(WMAP3) data releases shows that the raw data have hardly changed on large scales. However, there are several ‘all-sky’ renditions of the data and these do lead to significant disparities: ... this is true regarding the intensity of the AoE, so that discussions should emphasize not so much [the] first-year versus third-year data, but the various treatments of the Galactic plane region. The second fault line concerns the ‘meaning’ of the detection, and by this we mean the robustness of the statistics used.⁴⁶⁴

Elsewhere, Craig Callender has criticised the adoption of cosmic time (being the time coordinate which adopts the ‘big bang’ singularity as its projected origin) as a ‘scientific basis’ of a preferred frame for objective becoming: ‘A problem with this is that cosmic time depends on a special global matter distribution, and it is counterintuitive to think of time as depending for its existence on the initial distribution of matter.’⁴⁶⁵

Although simple empirical adequacy can still be achieved by asserting that the preferred frame is undetectable, clearly empirical data contributory to the assertion of a preferred frame affects not only the plausibility of achieving empirical adequacy, but also potentially the strength of the strategy of Undermining.

The Undermining strategy is represented by attempts ‘to show that the scientific metaphysics (in this case the claim that there is no absolute frame of reference and thus no absolute simultaneity and no unique present) is not really involved in the generating the empirical success of STR.’⁴⁶⁶ We recall that this involves demands of independent motivation, explanatory power and not being *ad hoc*. If the *ad hoc* approach is represented by simply stating a preferred frame which is undetectable, the *non-ad hoc* approach is to attempt a neo-Lorentzian theory in which compensatory phenomena explain our inability to detect the ‘æther frame’. Because the scientific metaphysics is negatively couched (*no* privileged frame), Hawley notes that the alternative is a ‘more expansive theory’⁴⁶⁷ – this may have some effect on how it is criticised, as we shall see. We remember that Undermining is completed by independent argumentation in favour of the alternate metaphysics – we have already seen an example of this being attempted in the previous chapter. Hawley reminds us that

this argument must now be done within the assumptions already made in order to defend the Lorentz theory (or other alternative). That’s to say, presentists must explain the advantages of presentism in a world in which we are unable to detect which spatially-distant events are present.⁴⁶⁸

⁴⁶⁴ Kate Land and João Magueijo, ‘The Axis of Evil Revisited’, *The Monthly Notices of the Royal Astronomical Society* 378:1 (2007), p.153

⁴⁶⁵ Callender, ‘Review of Mauro Dorato *Time and Reality*’, p.120

⁴⁶⁶ Hawley, ‘Science as a Guide to Metaphysics’, p.462

⁴⁶⁷ Hawley, ‘Science as a Guide to Metaphysics’, p.462

⁴⁶⁸ Hawley, ‘Science as a Guide to Metaphysics’, p.462

This will be of greater importance when we turn to examine epistemological issues in chapter six.

The final element is Counterargument, which in this case means that the presentist accepts that STR's ability to be empirically successful without positing a preferred frame counts against presentism, but argues that independent considerations overwhelm this point. Once again, we have seen in the previous chapter how some independent considerations have failed, and we shall look at a better example in chapter six, where we assess Craig's argument that belief in the present enjoys such epistemic privilege as to defeat anything brought against it.

What is now required is some discussion of Craig's attempt to save presentism, with careful correlation of that attempt with the ideas above.

Critique of Presentism and Special Relativity – Groundwork

The 'short version' of an account of Craig's defence is that he pursues a strategy of Undermining. However, unfortunately things are not quite that straightforward. Before we can consider whether his neo-Lorentzian account provides the requisite elements of empirical adequacy and explanatory power, we must attend to other issues raised. First, there is the distinction between physical and metaphysical time, and Craig's relating of this to physical science by appeal to Newton. Second, there is Craig's attempted 'debunking' of Einsteinian relativity by an attack on its/his alleged positivism/verificationism. Finally, there is the question of whether Craig is (in Hawley's terminology) being an optimist or a pessimist – i.e. whether he thinks the presence of a metaphysical claim in an empirically successful scientific theory is a reason to support that claim. This final point is key to both understanding and criticising Craig's approach.

A vital part of Craig's position is the distinction between physical and metaphysical time. This distinction is not terribly controversial (depending upon how it is cashed out); as DeWeese says in his introduction, 'Metaphysical time refers to the succession of moments (events) through which concrete objects persist. Since there are possibly concrete objects that are not physical, metaphysical time is not identical to physical time.'⁴⁶⁹ Padgett relies on metaphysical time for his view that God is outside (physical) time but temporal (metaphysically), a position he requires because he supports an A-theoretical view of time and claims that God transcends our (physical)

⁴⁶⁹ DeWeese, *God and the Nature of Time*, p.10

time as creator of it. Craig points out that God could cause a temporal sequence by ‘counting down’ to the moment of creation: this would be outside of physical time and space, those being as yet uncreated.⁴⁷⁰ Elsewhere he argues that our commitment to ‘absolute time’ is evident from our desire for increasingly accurate clocks.⁴⁷¹ However, all of this says nothing about frames of reference or the importance of the present: it simply commits us to the position that the reality of time could be independent of time as a physical phenomenon. Additionally, it seems that physical and metaphysical time would have to be related in some way, *if co-extant*, in order for the notion of metaphysical time to be able to do work – for example, if God was in a metaphysical time entirely unrelated to physical time, it would actually sharpen the problem of divine knowledge of, or interaction with, the world⁴⁷².

Craig’s attempt to make the concept of metaphysical time do work for him with respect to reconciling presentism with physics begins with Isaac Newton. He explains that for Newton space and time in the absolute and metaphysical sense are emanative from God⁴⁷³: God is eternal in the sense of everlasting and omnipresent, and these give rise to absolute space and time.⁴⁷⁴ I shall not go into deeper discussion here, since this has only passing interest for us: it assumes two attributes of God which *this* inquiry is not entitled to assume – and neither for that matter is Craig’s. So Newton’s theological views do not provide direct help in arbitrating the interaction of science and philosophy.

Pressing on, Craig grants that Newtonian science can be corrected by relativity theory in that Newton’s concept of physical time can be corrected: ‘[Newton] assumed too readily that that an ideal clock would give an accurate measure of metaphysical time independently of its motion.’⁴⁷⁵ However, according to Craig this leaves Newtonian metaphysical time untouched.⁴⁷⁶ Thus we see Craig’s argument take embryonic form: by allowing that Newton’s physical time can be corrected whilst his metaphysical time retains cogency, Craig leaves the door ajar for a version of relativity theory incorporating metaphysical time.

To strengthen his position, Craig brings into play some suitably doomed positivistic complaints that Newton’s absolute space and time cannot exist (‘How does

⁴⁷⁰ Craig, *The Tenseless Theory of Time*, p.123

⁴⁷¹ Craig, *The Tenseless Theory of Time*, p.37

⁴⁷² Cf Leftow, *Time and Eternity*, p.272

⁴⁷³ Craig, *The Tenseless Theory of Time*, p.44-45

⁴⁷⁴ Craig, *The Tenseless Theory of Time*, p.40-41

⁴⁷⁵ Craig, *The Tenseless Theory of Time*, p.52

⁴⁷⁶ Craig, *The Tenseless Theory of Time*, p.52

one give meaning to Newton's absolute space ... [it] is unobservable, nonexistent.'⁴⁷⁷), pointing out that this sort of challenge would not worry Newton and should not worry us. He concludes:

Even if we do not go so far as Newton in including discourse about God in scientific theorizing, still it is clear that if we are prepared to draw metaphysical inferences about the nature of space, time, and spacetime on the basis of physical science, then we must also be ready to entertain theistic metaphysical hypotheses such as Newton deemed relevant.⁴⁷⁸

Several points arise. First, countenancing absolute metaphysical time still tells us nothing about either what physical time is like or how it relates to metaphysical time. Second, if Craig's view is to be dependent on asserting God's temporality then it seems unfit for the purpose of contributing to a discussion designed to decide whether or not God is temporal (a discussion which Craig himself has stated relies upon arbitrating the A- vs. B-theory debate, for which the physics of time is a key component). Third, regarding the idea of metaphysical time, there is nothing here other than theological assertion to prevent us from taking metaphysical time to be the tenselessly existing time of the B-theoretical view.

Finally, and most importantly, it is not apparent why we should accept, without good reasons, that the capacity to draw metaphysical inferences from physical science should translate to a capacity to use any sort of metaphysical hypothesis we care to. In particular, as we saw in chapter two, theological claims are not the sort of claim that could find confirmation through involvement in an empirically successful scientific theory. So the claims 'God brings about absolute time and space' and even 'metaphysical time and space exist' are not really the sort of claims that could be involved in a scientific theory; rather, one would need something like 'there is a privileged frame giving absolute simultaneity' accompanied by independent philosophical arguments in favour of metaphysical time and corollary arguments linking that time with the idea of a preferred frame.

On a different tack, Craig pursues his assault on the positivism that he set up against Newton and attempts to argue that standard relativity theory 'eliminates' metaphysical time, space and the æther by the use of a positivistic approach in its theoretical development ('What justification did Einstein have for so radical a move? How did he know that metaphysical time and space do not exist? The answer, in a

⁴⁷⁷ Craig, *The Tenseless Theory of Time*, p.52 citing C. Misner, K. S. Thorne and J. A. Wheeler, *Gravitation* (San Francisco: W. H. Freeman, 1973), p.19

⁴⁷⁸ Craig, *The Tenseless Theory of Time*, p.53

word, is positivism.’⁴⁷⁹). What he means by this is that metaphysical time (etc.) are eliminated from physical theory, and if one continues to hold onto positivism outside of physical theory then they are eliminated *per se*, since metaphysics is debarred from attributing meaning or existence to anything beyond the empirical world. On the other hand, Craig wishes to hold up people like Lorentz as scientists who were able to correct the Newtonian physical time without losing hold of metaphysical time.⁴⁸⁰ This will be the next important step for Craig’s reconciliation of physics and presentism.

Craig thus expends a great deal of effort on giving a historical portrayal of ‘Einstein as positivist’⁴⁸¹, dismissing his later explicit repudiation of positivism as ‘beside the point for our purposes’⁴⁸² on the grounds that he wrote his key special relativity papers whilst still under its sway. He complains that ‘by abandoning the presuppositions of absolute time and space and substituting in their stead operational definitions, Einstein reduces time and space to our measurements of them.’⁴⁸³ The general tone of Craig’s discussion tends towards ‘it’s verificationism gone mad’, but we should note instead that Einstein is primarily interested in responding to the problem of making mechanics and electromagnetics/optics work together: as we saw towards the beginning of this chapter, on an æther theory it is likely that we will never know which is the preferred frame and therefore how to adapt and correct our physical theories.⁴⁸⁴ It is the assumption that Einstein makes – that the laws of physics are the same in all frames, there being no preferred frame corresponding to absolute time or space – and not the philosophical methodology which may have suggested that assumption, which stands to gain confirmation from incorporation into an empirically successful scientific theory on an optimistic view.

We might tentatively suggest an early diagnosis of the real issue here: predictive ability, empirical adequacy and involvement are tied together. Accepting that we ought not to be naïve realists – accepting that empirical data does not straightforwardly entail

⁴⁷⁹ Craig, *The Tenseless Theory of Time*, p.54

⁴⁸⁰ Craig, *The Tenseless Theory of Time*, p.54

⁴⁸¹ Craig, *The Tenseless Theory of Time*, pp.54-69

⁴⁸² Craig, *The Tenseless Theory of Time*, p.69

⁴⁸³ Craig, *The Tenseless Theory of Time*, p.65

⁴⁸⁴ It is notable that one can, apparently, have verificationist tendencies oneself and still be upset with Einstein’s relativity. Nordenson, writing in the 1960s, complains at length that Einstein’s new time concepts are not really experimentally verifiable, even if the theory attains some empirical success, and that, as defined by the symbols used, they cannot be said to ‘have a physical meaning... *They are in principle only the result of mathematical constructions.*’ See Harald Nordenson, *Relativity, Time and Reality: A Critical Investigation of The Einstein Theory of Relativity from a Logical Point of View* (London: George Allen and Unwin Ltd, 1969), p.196, see also p.28 and throughout.

metaphysical content – does not equate to a declaration of the irrelevance of science for metaphysics.⁴⁸⁵

Another way of approaching this is to use Hawley's observation that non-empirical content may not have equal distribution (in terms of its contribution to success or to error) across a scientific theory. The fact that Einstein was strongly positivistic when he first wrote on relativity theory may translate neither to support for positivism from STR nor to the position that STR does not tell us anything about metaphysical time. As Dorato puts it in his review of Craig's *Time and the Metaphysics of Relativity*:

Granting that Einstein's criterion for synchronizing two clocks at a distance is verificationist in essence ... it does not follow that just because the positivist theory of meaning has been abandoned, we should feel justified to reintroduce in science wild metaphysical hypotheses with no independent support from science.⁴⁸⁶

We have already seen a move towards favouring those who are 'not positivistic' and therefore open to keeping Newtonian metaphysical time whilst correcting the concept of physical time. As the next preliminary to his defence of a neo-Lorentzian view, Craig discusses the ways in which metaphysics and physics have increasingly interacted. Rather than seeing this as a conjunction of the points (i) theory necessarily outruns empirical data and (ii) the success of scientific theory may be seen as offering confirmation of a metaphysical claim, he chooses to interpret metaphysics as something 'different' which dilutes science's old-fashioned positivism. For example, he cites comments by John Barrow on criteria for what counts as 'science' and the entry of concepts such as *creatio ex nihilo* into scientific discussions⁴⁸⁷; he states that 'during the last few decades, theoretical physics has become characterized precisely by its metaphysical, speculative character'⁴⁸⁸ and concludes that 'like it or not, theoretical physics has become thoroughly impregnated with metaphysics.'⁴⁸⁹

⁴⁸⁵ We might choose to see an analogy with pre-Copernican astronomy looming: if we retain absolute time and develop a neo-Lorentzian theory to account for it, and all of this on the basis of the need for metaphysical weight in our thought, then why not say that the Earth is after all the centre of the universe? We may have metaphysical or theological reasons for asserting it, and our advanced mathematics could certainly cope with the complicated system of epicycles required to explain the movements of the stars and planets. The problem, of course, is that this cannot match up with the laws of physics as we have construed them – but then, this is what Craig is claiming *in favour of* his approach, concerning metaphysical sophistication. The pre-Copernican point does not apply to discussions other than Craig's brand of metaphysically/theologically centred argument, since the (neo-)Lorentzian can be distinguished perfectly well on scientific grounds – see comments by Zahar, 'Why Did Einstein's Programme Supersede Lorentz's?', p.104 n.1

⁴⁸⁶ Mauro Dorato, 'Review of William Lane Craig, *Time and the Metaphysics of Relativity*', *Studies in History and Philosophy of Modern Physics* 34B:1 (2002), p.156

⁴⁸⁷ Craig, *The Tenseless Theory of Time*, p.81

⁴⁸⁸ Craig, *The Tenseless Theory of Time*, p.74

⁴⁸⁹ Craig, *The Tenseless Theory of Time*, p.77

This raises the suspicion that Craig has confused the role of metaphysical claims as part of theoretical content with the metaphysically speculative discussion instigated by certain empirically testable phenomena. But it also brings into focus a question that has been on the periphery of all Craig's points in this section: exactly what does he think metaphysical involvement in scientific theory is, and what does a scientific theory's success do for any involved metaphysics? In short, is he pessimistic or optimistic? The answer, unfortunately for Craig's position, appears to be 'both'.

That Craig exhibits a bizarre commitment to both pessimism and optimism has been noted, although in different terms, by Dorato in his review of *Time and the Metaphysics of Relativity*. Observing two apparent contrasting positions in Craig's work, Dorato attempts to provide a concise characterization:

According to the first, "relativity physics...is not necessarily saying anything that is relevant for the metaphysician" (p. 152), a claim that tends to be advanced whenever evidence coming from physics is against his metaphysical views. The second position is that physics "*confirms*" certain metaphysical and theological views over others, a claim that is put forth whenever evidence for the existence of a privileged frame (coming for instance from cosmic time or quantum non-locality) seems more reassuring.⁴⁹⁰

We can see this very clearly in terms of pessimism and optimism: in response to arguments for a scientific metaphysic, Craig seems to adopt the view that (although metaphysical beliefs must be empirically adequate) the presence of a metaphysical claim in an empirically successful scientific theory is no reason to think the claim true. When promulgating his own views, the presence of an (alternate) metaphysical claim in empirically scientific theories is a reason to think the claim true. An outraged-sounding Dorato observes of the former situation:

Since Craig assumes that only an outmoded verificationism could identify physical time with metaphysical time (p. 160-162, p. 170), for him the abandonment of positivism automatically entails the independence of metaphysics from physics. *Given this independence, however, why worry about physics at all and [why] write a book on the metaphysics of relativity?*⁴⁹¹

In fact, I would argue that it is Craig's assault on the 'positivism' of standard relativity theory which allows him to make the move from pessimism to optimism. By arguing that we should 'start from scratch' and disregard positivistic tendencies whilst embracing the metaphysical absolute time which should not have been discarded in the first place, he can invoke a neo-Lorentzian theory and call the metaphysical claims it

⁴⁹⁰ Dorato, 'Review', p.156

⁴⁹¹ Dorato, 'Review', p.156

involves ‘scientific metaphysics’, available for confirmation by predictive successes of the new theory. But this move is faulty: he accepts that standard STR is empirically adequate and viable, and that it is an empirically successful scientific theory, so it still makes sense for us to ask what sort of metaphysical claims might be confirmed by STR if we are to be optimistic. It makes even more sense to do so if my aforementioned point – that it is the assumption that Einstein makes (of no preferred frame) that stands to gain by confirmation, and not the positivism that influenced him to make it – is accurate.

Indeed, Craig’s conclusion to his discussion of modern science and its treatment of time states that his challenge is to show ‘exactly how the relativity of physical time, which has been well-established empirically, is to be reconciled with the objectivity of temporal becoming and the absolute simultaneity that the A-theorist postulates of metaphysical time.’⁴⁹² This is just as unclear as it needs to be for Craig to get the best possible basis for urging a neo-Lorentzian physics, but it drives the careful reader to ask in what ‘the empirically well-established relativity of physical time’ consists if not in the success of standard relativity theory – a theory, which, by definition, goes beyond merely reporting the empirical data. Having dismantled (with unfortunate but necessary brevity) much of the machinery that Craig has carefully constructed to lend credence to his strategy, we are back, finally, to the issue of Undermining and the question of whether Craig in fact supplies an adequate scientific position to level the scientific playing field. It is to the criticism of that position that we now turn.

Critique of Presentism and Special Relativity: Craig’s Neo-Lorentzianism

Yuri Balashov and Michael Janssen provide a response to a number of Craig’s arguments and claims for the neo-Lorentzian approach and its alleged superiority over the standard interpretation of relativity theory. They are as follows: first, that Craig’s analysis of Einsteinian, Minkowskian and neo-Lorentzian relativity as ‘competitors’ is faulty. Second, that his criticism of Einsteinian relativity by way of its ontology is misplaced. Third, that his arguments for the explanatory deficiency of standard relativity are at worst unfounded and at best also effective against thermodynamics. Fourth, that what he takes as ‘neo-Lorentzian relativity’ is inadequate to the task he requires of it. Finally, that an empirically viable neo-Lorentzian relativity is explanatorily deficient in comparison with the standard interpretation such that we

⁴⁹² Craig, *The Tenseless Theory of Time*, p.104

should prefer the standard interpretation in a roughly equivalent way to that in which we should prefer Darwinism over special creation (understood as divine creation through processes not susceptible to scientific enquiry). In discussing these points I shall endeavour to supplement them with appropriate explanatory and critical material to improve our understanding of where Craig goes wrong.

In the first place, then, Balashov and Janssen take exception to Craig's characterisation of the three types of relativity theory as competitors.⁴⁹³ They argue that it is not a straight three-way fight. Rather, the 'relativity interpretation' is not an interpretation of the same sort as the others; it is primarily a theory of principle – a foundation upon which constructive theories can be built.

To provide a little more detail, Balashov and Janssen distinguish theories of principle from constructive theories in the following way:

In a theory of principle, one starts from some general, well-confirmed empirical regularities that are raised to the status of postulates (e.g. the impossibility of perpetual motion of the first and second kind, which became the first and second laws of thermodynamics). With such a theory, one explains the phenomena by showing that they necessarily occur in a world in accordance with the postulates. Whereas theories of principle are about the *phenomena*, constructive theories aim to get at the underlying *reality*. In a constructive theory one proposes a (set of) models(s) for some part of physical reality (e.g., the kinetic theory modelling gas as a swarm of tiny billiard balls bouncing around in a box). One explains the phenomena by showing that the theory provides a model that gives an empirically adequate description of the salient features of reality.⁴⁹⁴

They use the example of length contraction: Einsteinian relativity as a theory of principle explains length contraction if it shows that this necessarily occurs in a world with the relativity and light postulates. The Minkowski constructive theory explains length contraction by relating the length measurement to different sets of space-time axes arising from the relative motion of two observers; the neo-Lorentzian explanation relates 'dynamical effects and artefacts of measurement'. Balashov and Janssen admit that, viewed solely as a theory of principle, Einstein's theory gives no foundation for a preference of constructive theory. However, they argue, Einstein's 1905 paper shows a clear constructive leaning, seeing 'the effects derived from the postulates as manifestations of a new kinematics.'⁴⁹⁵ Janssen argues that Lorentz was only able to

⁴⁹³ Craig, *The Tenseless Theory of Time*, p.11-13 and throughout

⁴⁹⁴ Yuri Balashov & Michael Janssen, 'Presentism and Relativity', *British Journal for the Philosophy of Science* 54 (2003), p.331

⁴⁹⁵ Balashov & Janssen, 'Presentism and Relativity', p.332

reconcile his theory with the original relativity theory by looking on Einstein's theory as purely a theory of principle.⁴⁹⁶

Moving on to the issue of ontology, one might start by noting a rather unusual move by Craig at the beginning of his discussion in *The Tenseless Theory of Time*. In reaction to Putnam's (rather over-zealously scientifically realist⁴⁹⁷) argument⁴⁹⁸, Craig comments that 'Given his presentist commitments, the A-theorist's relativizing reality to reference frames is quite natural.'⁴⁹⁹ This – despite later discussion in terms of preferred reference frames – provides the key to understanding Craig's allegation of 'fragmented ontology', for he has sown the seed of a link between relativity theory and our 'intuitive' (i.e. presentist for Craig) conception of the universe as 'what is simultaneous with me-now is real'.

Craig's strategy is to affirm the strength of Minkowskian relativity as a competitor with Einsteinian relativity so that he can later discard Minkowskian relativity as explanatorily less powerful than neo-Lorentzian relativity and not ontologically informative. He does this by alleging that the ontology of Einsteinian relativity is bizarre and unsuitable. He begins:

Now the A-theoretical attempt to relativize tense and temporal becoming to reference frames presupposes ... the relativity interpretation of SR with its instrumentalist [i.e. anti-realist] understanding of Minkowski spacetime. But ... it is arguable that the resultant interpretation of SR is implausible and deficient. That is to say, Einstein's SR ought to be construed along the lines of the spacetime interpretation.⁵⁰⁰

He then argues that, because Einsteinian relativity is 'about physical objects enduring through time,'⁵⁰¹ it is clear that it involves 'the pluralistic fragmentation of reality into distinct spaces and times associated with reference frames.'⁵⁰² Moreover, 'one can change frames, and, hence, realities just by changing one's relative motion.'⁵⁰³

Balashov and Janssen seem a little puzzled by Craig's accusation that STR leads to a fragmented ontology – we will turn to their explanation of Einstein's relativity momentarily. I think their puzzlement stems from the fact that they miss the clever move Craig makes: by first implanting the idea that Einsteinian relativity is compatible

⁴⁹⁶ Micahel Janssen, 'A Comparison Between Lorentz's Ether Theory and Special Relativity in the Light of the Experiments of Trouton and Noble', PhD Thesis (University of Pittsburgh, 1995), Section 4.3.1

⁴⁹⁷ This is lampooned by Craig: 'Apparently losing all restraint in the heady atmosphere of a scientific convention, an ebullient Putnam declares...' Craig, *The Tenseless Theory of Time*, p.7

⁴⁹⁸ Putnam, 'Time and Physical Geometry', *Journal of Philosophy* 64 (1967), pp.240-247

⁴⁹⁹ Craig, *The Tenseless Theory of Time*, p.9

⁵⁰⁰ Craig, *The Tenseless Theory of Time*, p.15

⁵⁰¹ Craig, *The Tenseless Theory of Time*, p.12

⁵⁰² Craig, *The Tenseless Theory of Time*, p.15

⁵⁰³ Craig, *The Tenseless Theory of Time*, p.15

with presentist ontology because one can relativise existence, he is able to import the presentist intuition into Einsteinian relativity to show how ‘reality literally falls apart.’⁵⁰⁴ But this won’t wash, because Einstein did not carry presentist intuitions into his formulation of special relativity. In short, Craig is attempting to undermine Einstein with the same argument B-theorists use to reject presentism by way of relativity theory – i.e. relativised existence.

Balashov and Janssen give a brief but lucid account of how Einstein actually went about constructing his theory: ‘It is part of the nature of theories of principle that they avoid ontological commitments as much as possible... Rather than endorsing an ontology of three-dimensional objects, Einstein actually strips such objects of many of their classical properties.’⁵⁰⁵ Einstein and Minkowski both follow what Norton calls a ‘subtractive strategy’⁵⁰⁶: ‘geometries are characterized in terms of invariants of transformation groups associated with them. Reality is denied to all elements not invariant under the relevant group of transformations. In the case of SR this is the Lorentz group.’⁵⁰⁷ In other words, Einstein does not take normal objects and ‘pop them in and out of existence’; rather, he says that in the absence of absolute time and space and where physical laws are the same in your reference frame as in any other regardless of your speed or location, you will judge some events to be simultaneous which may not be so judged if you were differently related to them. Nowhere does he say ‘and, by the way, only what is simultaneous with you exists’ because that is not an element which can be considered invariant under the Lorentz transformations. Now Craig could quite easily reply that this subtractive strategy sounds like positivism, but inserting a premise into a theory just because you think it should not have been removed in the first place gives no justification for criticising the result as being ontologically bizarre.

Once we add to the above considerations the previous discussion of theories of principle *versus* constructive theories, we can see from a different angle that Craig really has little ground to stand on: if Minkowski is a development of Einstein in line with the constructive elements of Einstein’s theory, then Craig’s limited⁵⁰⁸ acceptance of Minkowski’s view of reality (‘on a spacetime ontology, there is thus a unified,

⁵⁰⁴ Craig, *The Tenseless Theory of Time*, p.16

⁵⁰⁵ Balashov and Janssen, ‘Presentism and Relativity’, p.335

⁵⁰⁶ Balashov and Janssen, ‘Presentism and Relativity’, p.335 citing J. Norton, ‘Geometries in Collision: Einstein, Klein, and Riemann’, in J. Gray (ed.), *The Symbolic Universe: Geometry and Physics, 1890 – 1930*, (Oxford: Oxford University Press, 1999), pp.128-144

⁵⁰⁷ Balashov and Janssen, ‘Presentism and Relativity’, p.335

⁵⁰⁸ Remembering that he will eventually prefer a neo-Lorentzian view.

independent reality which is merely *measured* differently'⁵⁰⁹) makes his rejection of Einstein's view even more tenuous.

We turn now to the charge of explanatory deficiency. This has several elements: first, that theories of principle in general are not very empirical and are thus not good explanatory bases; second, that Einstein's relativity postulates in particular are not very empirical and therefore not a good explanatory base; third, that the Einstein-Poincaré synchronisation method for obtaining simultaneity in a reference frame is conventional and therefore not a good explanatory basis for the relativity of simultaneity; finally, that length contraction and clock retardation are brute facts in Einsteinian relativity but have causal explanations in (neo-)Lorentzian relativity.

Craig states that 'as a theory of principle rather than a constructive theory, Einstein's SR is based on postulates which are characterized by their very non-empirical character.'⁵¹⁰ This is taken by Balashov and Janssen as having two points of contact: with theories of principle in general and with Einstein's postulates in particular. To the former – presumably reliant on the phrasing 'as a theory of principle' – they respond that thermodynamics is a theory of principle based on the postulates that 'perpetual motion of the first and second kind'⁵¹¹ is impossible. Einstein writes 'I came to the conviction that only the discovery of a universal formal principle could lead us to assured results. The example I saw before me was thermodynamics.'⁵¹² Consequently it is difficult to argue that theories of principle in general are explanatorily deficient, unless one is willing to take on both STR and thermodynamics at once.

To clarify the point against Einstein's view in particular, Craig quotes Holton and Goldberg's view that Einsteinian relativity's postulates 'were postulates for which there was and can be no direct empirical confirmation' making them non-verifiable and non-falsifiable⁵¹³. This may be compared with his comment 'of course, if there are good empirical grounds for accepting the postulates of a theory, then we may be justified or even forced to regard certain phenomena deduced therefrom as natural and not in need of any explanation.'⁵¹⁴ Of course, by Craig's own arguments this sort of

⁵⁰⁹ Craig, *The Tenseless Theory of Time*, p.16

⁵¹⁰ Craig, *Time and the Metaphysics of Relativity*, p.181; Craig, *The Tenseless Theory of Time*, p.113

⁵¹¹ Balashov and Janssen, 'Presentism and Relativity', p.331 referring to (i) a machine cannot produce more energy than it uses and (ii) a machine cannot spontaneously convert thermal energy into mechanical work.

⁵¹² Albert Einstein, 'Autobiographical Notes', in P. A. Schlipp (ed.), *Albert Einstein: Philosopher-Scientist*, (Evanston, IL: Library of Living Philosophers, 1949), p.53, cited Balashov and Janssen, 'Presentism and Relativity', p.332

⁵¹³ Craig, *The Tenseless Theory of Time*, p.113

⁵¹⁴ Craig, *The Tenseless Theory of Time*, p.33

thing should not trouble us at all – after all, he sees it as a strength of the Lorentzian view that it supports an æther frame, and invoking verificationism is *outré*.

However, charitably granting that there *might* be a case to answer, we can answer it. First, it is unclear how the two postulates (invariant laws in inertial frames + constant speed of light in a vacuum in all frames) are unfalsifiable. Second, both postulates are empirical in character insofar as the experiments described in the first section of this chapter and the attendant reasoning gives us cause both to (at least see what happens if we) reject a preferred frame of reference and – in conjunction with Maxwell's work – suggest a constant speed of light. Balashov and Janssen comment, for example, that 'Einstein ([1911], p.6) ... made it clear that he saw the light postulate as the secure core of classical electrodynamics.'⁵¹⁵

Let us now consider the position that the conventionality of establishing simultaneity in a frame of reference raises a question over the explanatory power of relativity theory. Certain errors in *The Tenseless Theory of Time* need to be cleared up first.

Craig uses David Malament's work⁵¹⁶ early on to argue that simultaneity is not conventional so that a preferred frame is an option.⁵¹⁷ He then carefully avoids use of Malament's work on p.95f ('The third thing to be noticed about SR's time concept is that it is predicated upon a definition of simultaneity which we are under no obligation to adopt.'⁵¹⁸). These are conceptually topsy-turvy, as I will show.

Malament's proof is designed to show that the means of specifying simultaneity within a frame of reference is not dependent upon a *conventional stipulation* of $\epsilon = \frac{1}{2}$ in the equation $t_2 = t_1 + \epsilon (t_3 - t_1)$ (where t_1 is the time of light emission from one location, t_2 is the time of arrival/reflection at a second location, t_3 is the time of return to the original location, and ϵ will be a variable such that $0 < \epsilon < 1$), being instead the only value definable under certain acceptable conditions. That is, it is not conventional that light travels 'there' in half the time it takes to travel 'there and back'. This is not a means of achieving a preferred frame, it is a means of defining simultaneity within a frame that will then give the result that simultaneity is frame-relative based on the development of relativity theory that proceeds from it. In other words, if ϵ is conventional then there is a question mark over what explanatory ontological conclusions can be drawn from the relativity of simultaneity, because the outcomes of

⁵¹⁵ Balashov and Janssen, 'Presentism and Relativity', p.333

⁵¹⁶ David Malament, 'Causal Theories of Time and the Conventionality of Simultaneity', *Noûs* 11 (1977), pp.293-300

⁵¹⁷ Craig, *The Tenseless Theory of Time*, p.11

⁵¹⁸ Craig, *The Tenseless Theory of Time*, p.95

the theoretical structure might be dependent on a conventional choice rather than a unique definition.⁵¹⁹

It is this latter point that Craig is beginning to address when he talks about ‘a definition of simultaneity which we are under no obligation to accept’⁵²⁰. But it is just here where a supporter of Malament would insert his proof to persuade us that we are under an obligation to accept it after all.

Craig rectifies most of this in his *Time and the Metaphysics of Relativity*, providing a good understanding of the debate⁵²¹ and saying instead that Malament’s work is dependent upon accepting Minkowskian relativity theory⁵²²; thus, it cannot be used to defend pre-Minkowskian relativity theory from the charge of conventionality:

In sum, while simultaneity relations established on the basis of Einstein’s clock synchronization procedure are not conventional within the context of SR, nevertheless they are conventional in the sense that within the context of discovering the structure of space and time the assumption that clock synchronization via light signals discloses relations of simultaneity between relatively stationary observers is gratuitous.⁵²³

It is here that Balashov and Janssen provide a suitable riposte:

The problem is much more benign than Craig makes it sound. First, Craig’s objection loses much of its force when we recognise the space-time interpretation as a constructive theory *complementing* the theory-of-principle-type relativity interpretation rather than as one of its rivals. We could then simply concede that a rigorous argument proving the uniqueness of the standard definition of simultaneity had to wait for the development of the space-time interpretation. Or we could try to re-write Malament’s argument ... in terms of the relativity interpretation. We do not even have to concede or do that much. We can justify the standard definition without appealing to Minkowski space-time. Making the appropriate assumptions about homogeneity and isotropy, we demand that ϵ be chosen in such a way that the velocity of light moving from A to B comes out to be equal to the velocity of light moving from B to A . The standard objection to this line of reasoning is that the one-way velocity of light can not be defined in the absence of a definition of simultaneity. But for the purpose of defining simultaneity, a necessary condition for any acceptable definition of velocity suffices. Making the assumptions of homogeneity and isotropy, in turn, suffices to justify that condition: equal distances travelled at the same velocity should take equal times.⁵²⁴

In other words, if you measure how long it takes for light to travel a round trip of a known distance, then if your accepted assumptions are that space is the same in all

⁵¹⁹ For historical review-type access to this area of debate, see R. Anderson, I. Vetharaniam, and G. E. Stedman, ‘Conventionality of Synchronization, Gauge Dependence, and Test Theories of Relativity’ *Physics Reports* 295 (1998), pp.93-180.

⁵²⁰ Craig, *The Tenseless Theory of Time*, p.95f

⁵²¹ Craig, *Time and the Metaphysics of Relativity*, pp.30-35

⁵²² Craig, *Time and the Metaphysics of Relativity*, p.35, cp p.42

⁵²³ Craig, *Time and the Metaphysics of Relativity*, p.42

⁵²⁴ Balashov and Janssen, ‘Presentism and Relativity’, p.334

directions and not ‘lumpy’, and that the velocity of light is constant, it seems fairly straightforward to work things out.

Notably, DeWeese addresses the issue of conventionality by arguing from a thought experiment which appears to suggest light velocity dependent on light-source velocity. As we have already seen (through the ‘binary star experiment’) this is not a sound basis for argument concerning light velocity, and indeed DeWeese notes that it is reliant upon a notion of substantial space, or æther.

The final charge of explanatory deficiency concerns the alleged ‘brute fact’ status of length contraction and clock retardation in Einstein’s theory. This is already abrogated somewhat by Craig’s statement (already noted) that ‘if there are good empirical grounds for accepting the postulates of a theory, then we may be justified or even forced to regard certain phenomena deduced therefrom as natural and not in need of any explanation.’⁵²⁵ We have seen grounds already for thinking that Einstein’s postulates have an empirical character rather than a metaphysically arbitrary one, so the question is over whether the phenomena are natural and not in need of explanation. Craig’s position is expressed as follows:

Not that the relativity interpretation [of Einstein] does not account adequately for all the phenomena, for it does. But a theory can account for all the phenomena without having much explanatory power.⁵²⁶

By giving causal explanation in terms of dynamic elements, Craig deems (neo-) Lorentzian relativity to be explanatorily superior. We have been over the ideas accompanying Minkowskian relativity understood as a constructive theory to complement Einstein’s relativity; they will not bear repeating. Instead, I will introduce Craig’s neo-Lorentzian relativity and discuss Balashov and Janssen’s argument that it is explanatorily deficient compared to standard relativity, rather than the other way around. This will automatically answer what remains of the objection above.

In *The Tenseless Theory of Time* Craig characterises a theory as neo-Lorentzian as follows:

A theory might be classified as neo-Lorentzian just in case it affirms (i) the round trip vacuum propagation of light is isotropic in a preferred (absolute) reference frame R_0 (with speed $c=1$) and independent of the velocity of the source, and (ii) lengths contract

⁵²⁵ Craig, *The Tenseless Theory of Time*, p.33

⁵²⁶ Craig, *The Tenseless Theory of Time*, p.32

and time rates dilate in the customary relativistic way only for systems in motion with respect to R_0 .⁵²⁷

A year or so later in *Time and the Metaphysics of Relativity*, Craig instead talks about (I can find nothing that he *defines* as his ‘neo-Lorentzian theory of choice’) the development of Lorentz’s theory as described by Zahar⁵²⁸ which is in turn partially based upon work by Adolf Grünbaum to show that the length contraction and clock retardation hypotheses could be added as amendments to the core of Newtonian mechanics and Lorentz’s Maxwellian electrodynamics without rendering the theory unfalsifiable⁵²⁹. Zahar also argues in his article that these not only avoid rendering the theory unfalsifiable, but also avoid allegations of being *ad hoc* on certain views of *ad hoc*-ness.

Balashov and Janssen argue that the sort of neo-Lorentzianism that Craig is willing to accept is not detailed enough to accomplish the work he demands of it: in particular, the two additions are not sufficient to render the resulting model Lorentz-invariant, which is what must be achieved if it is to compete empirically with the standard version of relativity.⁵³⁰ The accounts in both of Craig’s monographs cited above fall prey to the critical conclusion: ‘[Craig’s account] suggests that the contraction hypothesis and clock retardation hypothesis are all it takes to produce a neo-Lorentzian interpretation of SR. It actually takes a lot more.’⁵³¹

Using the work of Janssen on Lorentz⁵³² to provide the empirically viable theoretical foundation that Craig actually requires, Balashov and Janssen go on to present a number of stages of argument in order to demonstrate that the neo-Lorentzian approach is explanatorily deficient compared with standard relativity.

[W]hy is a rod in motion shorter than a rod at rest *rather than equally long*? For those who share the Newtonian presupposition implicit in this ... the neo-Lorentzian interpretation provides a very satisfactory answer... Contrary to what one would expect in Newtonian theory, the forces holding the rod together are not Galilean invariant but Lorentz invariant. As a consequence, the equilibrium state of a rod in

⁵²⁷ Craig, *The Tenseless Theory of Time*, p.108-9

⁵²⁸ See Zahar, ‘Why Did Einstein’s Programme Supersede Lorentz’s?’, especially p.100

⁵²⁹ See Adolf Grünbaum, ‘The Falsifiability of the Lorentz-Fitzgerald Contraction Hypothesis’, *The British Journal for the Philosophy of Science* 10:37 (1959), pp.48-50 and ‘The Special Theory of Relativity as a Case Study of the Importance of the Philosophy of Science for the History of Science’, in B. Baumrin (ed.), *Philosophy of Science* [The Delaware Seminar, vol. 2] (New York: Interscience Publishers 1962-1963), pp. 171–204

⁵³⁰ For a detailed account of the difficulties and possible amendments, see Balashov and Janssen, ‘Presentism and Relativity’, pp.336-8

⁵³¹ Balashov and Janssen, ‘Presentism and Relativity’, p.338

⁵³² Janssen, ‘A Comparison Between Lorentz’s Ether Theory and Special Relativity in the Light of the Experiments of Trouton and Noble’; Michael Janssen, ‘Reconsidering a Scientific Revolution: The Case of Einstein *versus* Lorentz’, *Physics in Perspective* 4 (2002), pp.421-446

motion with respect to the privileged frame is shorter than the equilibrium state of a rod at rest. For co-moving observers, however, it will appear to be the other way around since their clocks will not read the true time of the privileged frame but the Lorentz-transformed time of the moving frame.⁵³³

Alternatively, we could believe that space and time are not Newtonian: why should they be? The fact that everything behaves this way, not just the rod, inclines us to think that space and time are Minkowskian instead, and ‘length contraction is part of the normal spatio-temporal behaviour of systems in Minkowski space-time.’⁵³⁴

Balashov and Janssen employ an example of Roxanne seeing Cyrano’s nose in silhouette as he turns around: the nose-silhouette goes from small to large to small, as befits objects undergoing rotation in Euclidean space. How do we explain it?

Now it is true that for Cyrano’s nose to behave the way it does, it is necessary that the forces holding it together are invariant under spatial rotation. The question is what explains what. Does the Euclidean nature of space explain why the forces holding Cyrano’s nose together are invariant under rotation, or the other way around?⁵³⁵

Craig shows that he understands this point with respect to Einsteinian relativity when he uses Grünbaum’s analogy of Aristotelian and Newtonian science. Aristotle demands an external cause for any motion whatever, because the natural behaviour of all things is to be at rest; Galileo and Newton do not require a cause for uniform motion, only for a change in velocity. ‘Galileo and Newton could only shrug their shoulders or throw up their hands in despair, if an Aristotelian told them that he has a solution to the ‘problem’ of the external cause of uniform motion, whereas they do not.’⁵³⁶ However, because Craig sees Einsteinian relativity as an equal *competitor* with Minkowski (and neo-Lorentzianism), he argues that Minkowski provides more explanatory power *over against* Einstein, because Einstein’s ‘theory of principle’ only accounts for the phenomena and does not provide a constructive theory explanation.⁵³⁷ As we have seen, this is faulty reasoning. Nevertheless, he opens the door for the final argument by Balashov and Janssen when he says ‘the issue here is not whether theoreticians are acting consistently *within* the framework of their respective theories ... rather the question is ... a question of which theory or interpretation is to be adopted.’⁵³⁸

⁵³³ Balashov and Janssen, ‘Presentism and Relativity’, p.340

⁵³⁴ Balashov and Janssen, ‘Presentism and Relativity’, p.340

⁵³⁵ Balashov and Janssen, ‘Presentism and Relativity’, p.340

⁵³⁶ Grünbaum, ‘The Pseudo-Problem of Creation in Physical Cosmology’, *Philosophy of Science* 56 (1989), p.386

⁵³⁷ Craig, *The Tenseless Theory of Time*, p.32-3

⁵³⁸ Craig, *The Tenseless Theory of Time*, p.32

Balashov and Janssen's argument is a 'common cause' argument based on Perrin's argument for molecular reality:

In the neo-Lorentzian interpretation it is, in the final analysis, an unexplained coincidence that the laws effectively governing different sorts of matter all share the property of Lorentz invariance, which originally appeared to be nothing but a peculiarity of the laws governing electromagnetic fields. In the space-time interpretation this coincidence is explained by tracing the Lorentz invariance of all these different laws to a common origin: the space-time structure posited in this interpretation.⁵³⁹

They note that by using the description of neo-Lorentzianism that he does (which we have seen above to be inadequate to the task) Craig misses the full force of this argument: in brief, this will be because the extra assumptions needed as amendments for a proper neo-Lorentzian theory are more extensive and because the real emphasis for weighing explanatory factors is on what it is that renders a theory Lorentz-invariant.

To put the overall point in summary terms: Craig claims that neo-Lorentzian relativity is more explanatorily powerful because it posits distinct causes for length contraction and clock retardation rather than simply relying on the nature of spatio-temporal geometry to describe the behaviour and appearance of objects. These causes render laws Lorentz invariant. Balashov and Janssen reply that, *au contraire*, on a neo-Lorentzian view we cannot explain why everything is subject to these causes and so we cannot properly explain why all the laws are Lorentz invariant, whereas on the standard view Lorentz invariance is a result of the structure of space-time. Craig is, in short, pointing out specks of sawdust in Einstein and Minkowski's eyes, whilst failing to notice the plank in his own.

Craig's final attack against the standard relativity interpretation is to say of Minkowski relativity that 'it needs to be seriously called into question whether any such metaphysical reality as spacetime actually exists.'⁵⁴⁰ This of course goes to the heart of issues of endurance/perdurance, substantivalism/relationalism and one's view of time as well. But we have no need to engage this at so deep a level: the optimist's scientific metaphysic does not have to argue for a fully-blown spacetime ontology in which we allocate the status of 'reality' to every detail of Minkowskian theory, because the question we are trying to answer is just 'is there a preferred frame of reference available to support presentist claims?' To which we can reply that there seems to be reason to think that the *denial* of a preferred frame of reference is a claim which can avail itself of

⁵³⁹ Balashov and Janssen, 'Presentism and Relativity', p.342

⁵⁴⁰ Craig, *The Tenseless Theory of Time*, p.113

some support from an empirically successful scientific theory – support which its detractors have been unable to neutralise. Indeed, McCall and Lowe have argued, and concluded⁵⁴¹, that although relativised presentness and temporal passage are reasonable, absolute presentness and becoming as suggested by Craig (and Tooley's version of absolute becoming also) is ruled out if the Twins Paradox⁵⁴² describes an empirically viable state of affairs – which we have about as much reason to think it does as we have reason to expect muons to behave as they do (see the first section of this chapter).

In conclusion, we have seen a number of reasons to think that Craig's attempt at Undermining has failed. His challenges to the empirical adequacy, explanatory power, theoretical formulation, and ontological implications of standard relativity have foundered; his candidate for an empirically viable, explanatorily advantageous and non-*ad hoc* scientific theory to carry his alternate metaphysics has not fared well. Finally, his 'both/and' approach to the issue of pessimism and optimism, and his submission of divine temporality as a reason to pursue neo-Lorentzianism for optimistic purposes, whilst holding that an arbitration of the A- vs. B-theory of time is a prerequisite of discerning whether God is temporal or atemporal, place serious methodological question marks over his project. I suggest that the only option left to Craig is to adopt a strategy of Counterargument and find independent philosophical arguments which outweigh the apparent incompatibility of a privileged present with relativity theory, relying for empirical adequacy on the *ad hoc* addition of the concept of metaphysical time. The question of what the impact of relativity theory on presentism means for the structure of constraints with which this thesis is concerned, I leave until the completion of the discussion of Counterargument in the next chapter.

⁵⁴¹ Storrs McCall and E. J. Lowe '3D/4D Equivalence, the Twins Paradox, and Absolute Time', p.123

⁵⁴² Briefly, that if two space-travel capable twins follow two separate space-time paths, in virtue of one staying on Earth and the other making a round-trip at very high speed to some other location, then one will be older than the other by the end of it.

Chapter VI – The Status of the Present: Epistemology, Experience, and Reality

Introduction

In the previous chapter I argued that Craig failed to defend presentism successfully against the scientific metaphysics arrayed against it. This defence was, I diagnosed, conducted through Hawley's method of Undermining: Craig attempted to provide an empirically equivalent and explanatorily effective neo-Lorentzian theory of relativity which could support the philosophical weight of absolute temporal becoming and the idea that only the present moment exists.

However, this is not the end of the story. The strategy of Counterargument allows an alternate metaphysician to accept that a scientific metaphysic is supported by scientific theory, but to assert overwhelming independent philosophical argument as grounds for preferring the alternate metaphysic provided it is very basically empirically adequate. This condition is plausibly, if barely, attained by presentism through the assertion that there is a preferred frame of reference which is entirely undetectable, corresponding to 'metaphysical time', although this requires a charitable move by the B-theorist not to take relativity theory as confirming that Minkowski spacetime is straightforwardly real, but simply as confirming that there is no reason to postulate a preferred frame. In chapter four we saw some arguments concerning language and ontology, as well as an analysis of Craig's model of presentism, but concluded that they were unable to provide the leverage needed by the presentist for Counterargument. Nevertheless, there is a line of argument which Craig engages that could provide just the sort of independent support that he would need for Counterargument, should he (wisely, according to my reasoning) choose to abandon Undermining. It is to this line of argument that I now turn.

The theme of this section is epistemological. Although arguments in this area extend across concepts of tense and temporal becoming in general, addressing such a wide-ranging debate in the requisite detail will not be possible. However, discussion thus far has concentrated on the question of the present as ontologically privileged; most recently the Undermining strategy was aimed at establishing grounds for an absolute present through revision of the standard interpretation of relativity. Consequently, to keep a precise match for the purposes of assessing Counterargument, it is the epistemic status of the present on which I will concentrate here. To begin with I shall present, in brief, Craig's arguments for the epistemic privilege granted to the present by our

experiences. I shall discuss his treatment of purported ‘defeaters’ of such epistemic privilege and his conclusion concerning the importance of belief in the present. This comes at three levels of strength: at the first level, that belief in the present is properly basic; at the second level, that such a belief can defeat any epistemic challenge brought against it; at the third level, that belief in the present enjoys such an intrinsic and unassailable position in our noetic structure that its denial as urged by the B-theorist constitutes an act of irrationality.

I shall then respond to this complex of arguments by Craig. I aim to accomplish three separate things: first, to distinguish between the epistemic bases of belief in presentness and of belief in presentism with a view to showing that there are serious epistemic obstacles for any move to the latter from the former; second to uncouple belief in the presentness of things/events/experiences from the ascription of presentness as an ontological category; finally, to show that physical theory and empirical phenomena provide good reasons not to make the step from belief in the presentness of things/events/experiences to belief in a real and absolute present, and that Craig’s response to arguments from physical theory and empirical phenomena (invoking the ‘specious’ or ‘elastic’ present) provide even more reasons not to make the step from any of this to belief in a presentist metaphysics. I shall also attempt to show that the B-theorist is not irrational in pursuing the development of a B-theory.

Since Craig is unhappy with any A-theory other than his brand of presentism, I shall argue that he is not in a position to complete the strategy of Counterargument and provide overwhelming reasons to overrule the denial of a privileged frame of reference and absolute present constituting the scientific metaphysics discussed in the previous chapter.

Presentist Argument from the Experience of the Present

Craig’s epistemological resource of choice is Alvin Plantinga’s critique of classical foundationalist epistemology and development of the concept of ‘properly basic beliefs’ (often under the aegis of the term ‘reformed epistemology’). The key difference between Plantinga’s epistemology and classical foundationalism is that ‘typically classical foundationalists have maintained that p is properly basic for a person S if and only if p is either self-evident to S or incorrigible for S or evident to the senses for S .’⁵⁴³ Plantinga wants a less restrictive view of proper basicity.

⁵⁴³ Craig, *The Tensed Theory of Time*, p.134

Craig begins by sketching the basics of Plantinga's epistemology, which he wants to employ for his arguments concerning tense. A *noetic structure* is 'the set of propositions believed by a person together with certain epistemic relations holding between those propositions and that person.'⁵⁴⁴ Rationality can be attributed to one's noetic structure if it is free of epistemic defects or results from proper fulfilment of one's epistemic duties. The basic machinery of the epistemology is summarised as follows:

In a rational noetic structure, certain beliefs will be foundational, not being accepted on the basis of other beliefs. In such a structure, the basis relation is both irreflexive and asymmetric. No proposition is believed on the basis of itself; propositions which are not believed on the basis of other propositions are simply taken as evidently true. Moreover, if a belief that *p* is based upon the beliefs that *q*, *r*, *s*, then none of the latter is believed on the basis of the belief that *p*. A rational noetic structure can thus be pictured as a hierarchy of levels of beliefs, such that beliefs in one level are immediately based on beliefs in the next lowest level, where *p* is believed immediately upon the basis of *q* if *p* is based on *q* in that noetic structure and there is no belief *r* such that *r* is based on *q* and *p* is based on *r*. In a rational noetic structure, if *p* is based on *q*, then the level of *p* is higher than the level of *q*, where the level of a belief in a noetic structure is its highest level in that structure. This guarantees that the basis relation is irreflexive and asymmetric.⁵⁴⁵

He reflects upon the difficulties of characterising the 'basing relation' which connects each level in the hierarchy, following Plantinga in referring to the concept of 'support' which a lower level provides to an upper level as 'provision of evidence for'⁵⁴⁶: 'In a rational noetic structure, the degree of support lent by the foundational beliefs to a particular non-basic belief will determine the strength of that belief.'⁵⁴⁷ Finally, he turns to the distinction between *degree* of belief and *depth of ingression* of a belief in giving an account of the support given by a lower-level belief for a higher-level belief⁵⁴⁸. In short:

Degree of belief has to do with the firmness with which one holds a belief. A person holds some of his beliefs very strongly, others quite tentatively. Depth of ingression has to do with the impact wrought on one's noetic structure were one to abandon the belief in question.⁵⁴⁹

⁵⁴⁴ Craig, *The Tensed Theory of Time*, p.133, citing Plantinga, 'Reason and Belief in God' in Alvin Plantinga and Nicholas Wolterstorff (eds.), *Faith and Philosophy* (Notre Dame, Ind.: University of Notre Dame Press, 1983), p.48

⁵⁴⁵ Craig, *The Tensed Theory of Time*, p.133-4

⁵⁴⁶ Craig, *The Tensed Theory of Time*, p.134

⁵⁴⁷ Craig, *The Tensed Theory of Time*, p.134

⁵⁴⁸ Craig, *The Tensed Theory of Time*, p.134

⁵⁴⁹ Craig, *The Tensed Theory of Time*, p.134

Although a person's basic beliefs may well be strongly held and deeply ingrained, this is not necessarily the case, because the beliefs admitted as properly basic are not restricted to those in accordance with the criteria of classical foundationalism. Nevertheless, they can still be properly basic. Craig quotes Plantinga's examples of believing that I see a tree and believing that I had breakfast this morning. In both cases, the belief is properly basic because I do not believe either on the basis that I *seem* to see a tree and *seem* to remember having breakfast respectively: although I may turn my attention to these experiential elements at will – and may do so if challenged in my belief – it is nevertheless the case that what I take as basic is that there *is* a tree there and I *did* have breakfast this morning⁵⁵⁰.

When it comes to fleshing out Plantinga's concept of properly basic belief, Craig allows context and the idea of the rationality of a noetic structure to play their parts fully:

...in order to be properly basic, beliefs must be "grounded" in certain circumstances, which, while not serving as evidence from which the beliefs in question are inferred, do furnish the appropriate contexts for the proper acceptance of the beliefs in a basic way. If it appears to me that I am sitting in my office reading a book, then it would be improper for me to form the belief that *I see a tree*. In such circumstances, I should form the belief that *I am sitting in my office reading a book*. When beliefs are accepted in a basic way under the appropriate circumstances, then they are properly basic, and the person holding them is justified in so doing in the sense that he is within his epistemic rights and exhibits no noetic defect in so believing.⁵⁵¹

Craig also follows Plantinga in asserting that properly basic belief is able to be upheld in the absence of criteria of proper basicity. Plantinga himself has suggested that such criteria will require an inductive approach using examples of beliefs and conditions. For example:

Accordingly, criteria for proper basicity must be reached from below rather than above; they should not be presented as *ober dicta* but argued to and tested by a relevant set of examples. But there is no reason to assume in advance that everyone will agree on the examples.⁵⁵²

Nevertheless, Craig views it as unreasonable 'to abandon beliefs normally taken to be properly basic until we succeed in coming up with an adequate criterion.'⁵⁵³

⁵⁵⁰ Craig, *The Tensed Theory of Time*, p.135 citing Plantinga, 'Reason and Belief', p.49

⁵⁵¹ Craig, *The Tensed Theory of Time*, p.136

⁵⁵² Alvin Plantinga, 'The Reformed Objection to Natural Theology', in Michael Peterson et al, *Philosophy of Religion: Selected Readings* (Oxford: Oxford University Press, 1996), p.320

⁵⁵³ Craig, *The Tensed Theory of Time*, p.137

Vitaly, Craig then moves on to consider defeasibility, and the way in which properly basic beliefs may be separated from being 'knowledge' or 'true'. 'The relevant point here is that properly basic beliefs may be robbed of the justification which they enjoy in virtue of the circumstances in which they were formed.'⁵⁵⁴ In order to *retain* a belief as properly basic in the face of such an effective defeating challenge (which may call upon further circumstantial or exceptional evidence, or upon arguments such as, for example, proof of incoherence), Craig classifies three possible types of what he calls 'defeater-defeaters'. These are rebutting-defeaters, undercutting-defeaters and overwhelming-defeaters. The first 'show that the alleged defeater's conclusion is false', the second 'show merely that the alleged defeater's conclusion has not been shown to be true'⁵⁵⁵, whilst the third emphasises and argues that the original belief has such strong justification compared to the challenge that it intrinsically denies the conclusion of the challenge without either demonstrating its falsity or its failure to provide an argument to the truth. Since this third is rather perplexing, an example may be in order. Craig cites Plantinga's example of someone accused of a theft where all the evidence is against them, but where they themselves 'clearly and correctly' remember that they were not present at the crime and could not have committed it. Thus, the memory belief overwhelms the defeaters of evidence brought against it, and the person is not obliged to agree that they committed the crime in order to retain a rational noetic structure.

Craig's argument in sketch, then, is 'that belief in the objectivity of tense and the reality of temporal becoming is a properly basic belief'⁵⁵⁶, and further that 'belief in the reality of tense and temporal becoming enjoys such powerful positive epistemic status for us that not only can we be said to know that tense and temporal becoming are real, but also that this belief constitutes an intrinsic defeater-defeater which overwhelms the objections brought against it.'⁵⁵⁷ If this is not possible, Craig's 'back-up' strategy is to show only that such belief in the objectivity of tense *is* properly basic *and* can provide the means to refute any defeaters with which supporters of the B-theory challenge it. In terms of noetic structure, he claims that 'belief in the past, present and future and in temporal becoming is properly basic, ... possesses an enormously high degree of belief, making its complete abandonment ... virtually impossible'⁵⁵⁸ and has a depth of ingression such that no-one could accommodate their noetic structure to its rejection.

⁵⁵⁴ Craig, *The Tensed Theory of Time*, p.137

⁵⁵⁵ Craig, *The Tensed Theory of Time*, p.137

⁵⁵⁶ Craig, *The Tensed Theory of Time*, p.138

⁵⁵⁷ Craig, *The Tensed Theory of Time*, p.138

⁵⁵⁸ Craig, *The Tensed Theory of Time*, p.139

As previously noted, we here concentrate on Craig's discussion of the experience of the present. He writes of events that '[w]e experience them as irreducibly present. Moreover, it is clear that we do not infer the presentness of events from our experience of them; we just are appeared to presently.'⁵⁵⁹ He argues that our default use of the present tense, even in the absence of indexicals, clearly implies a vantage point rather than a mere self-conscious inference. He takes this sort of argument to dispose neatly of points such as Grünbaum's translational schema that *e* at *t* occurs *now* if a mind-possessor *M* experiences *e* such that at *t* *M* is conceptually aware that *M*'s experience of *e* is simultaneous with *M*'s experience of experiencing.

In other words, Craig takes the 'vantage-point' nature of the presence of experience to defeat any position which takes an 'examination of consciousness' view of the presence of experience in order to accommodate the B-theory. Smith, in a similar example, refers to the 'unreflexive awareness of events as past, present, or future' as opposed to 'my reflexively grasping my own perceptual experience of the event.'⁵⁶⁰ Craig places the fault in Grünbaum's position with the conflation of presentness and now-ness. Such an analysis of now-ness as mind-dependent works as a restricted analysis of a reflexive concept, Craig argues, but does not affect presentness, which is not analysed reflexively but simply perceived in reality. Thus, as an analysis of now-ness it may work, but as an analysis of presentness it misses the mark.

Craig concludes his opening statement by arguing that his vantage-point assessment of the experience of presentness means that '*e* happens now' is really no different from simply '*e* happens'. The latter is a 'basic belief grounded in part in the circumstances that we are appeared to in just that way.'⁵⁶¹ (i.e. *that* we are experiencing an event grounds our belief that it occurs). In that sense, appending our temporal vantage-point explicitly only serves to emphasise what is already contained within the simple statement. Therefore, Craig argues, if '*e* happens' can be considered properly basic – and this is far less controversial than many examples of properly basic belief – then the apparently more controversial '*e* happens now' can also be considered properly basic, since it is materially no different from the simpler statement.

I shall now turn to the various defeaters which Craig considers to be brought against this position. He begins with Mellor's (*Real Time*) arguments. This can be roughly divided into two points: first, that we do not observe the tense of events and that

⁵⁵⁹ Craig, *The Tensed Theory of Time*, p.139

⁵⁶⁰ Quentin Smith, 'The Phenomenology of A-Time', *Dialogos* 52 (1988), p.147-148, cited Craig, *The Tensed Theory of Time*, p.139 n.26

⁵⁶¹ Craig, *The Tensed Theory of Time*, p.140

our phenomenology of temporal consciousness is mistaken. Second, that our purported judgement of our experiences as being present is mistaken.

Craig spends some time in the preliminary deconstruction of Mellor's argument. He identifies one interpretation – the claim that we do not observe tenses as sensible properties – as a straw man, saying that 'if he did mean to prove only that presentness is not a sensible property of events/things in the external world which we observe directly and indefeasibly, then he has proven very little, indeed.'⁵⁶² He bases his discarding of this interpretation on the fact that Mellor's examples 'of our purported observations of presentness are not examples of our observing a sensible property'⁵⁶³ – for example, they involve discussion of memories.⁵⁶⁴ Thus, Craig takes Mellor as wanting 'to prove that we do not at all observe the presentness of events/things in the external world' which he transforms into 'we have no basic belief at all in the presentness of events/things in the external world.'⁵⁶⁵ Now, it is not self-evident that demonstrating that we do not observe external events/things as present does not equate to demonstrating that we have no properly basic belief in their presentness. However, we will bear with Craig for a while.

He summarises Mellor's argument as the claim that '[w]e have confused our observing the events to be present with the events themselves being present.'⁵⁶⁶ Thus, he quotes Mellor as saying 'I observe a number of events, and I observe the temporal order in which they occur... I do not observe their tense.'⁵⁶⁷ Mellor invokes examples of physical theory correcting basic beliefs, such as for astronomical observation: there is nothing about the view through a telescope that tells the viewer how long ago the viewed event occurred.

Craig alleges major difficulties with Mellor's argument, claiming that it does not work against the position that he, Craig, has framed and stating that 'Mellor's analysis of the phenomenology of temporal consciousness is plainly unrealistic and contrived.'⁵⁶⁸ He begins by re-emphasising the point that we typically have no reflexive belief (that I am experiencing observations of an event), but simply a belief (that the event is happening). I must admit that I do not see how this answers Mellor's point that we have confused 'experiencing E to be present' with 'E being present'; if anything, it

⁵⁶² Craig, *The Tensed Theory of Time*, p.142

⁵⁶³ Craig, *The Tensed Theory of Time*, p.140

⁵⁶⁴ Mellor, *Real Time*, p.25

⁵⁶⁵ Craig, *The Tensed Theory of Time*, p.142

⁵⁶⁶ Craig, *The Tensed Theory of Time*, p.142

⁵⁶⁷ Mellor, *Real Time*, p.26, cited Craig, *The Tensed Theory of Time*, p.143

⁵⁶⁸ Craig, *The Tensed Theory of Time*, p.143

seems like a confirmation of it. Presumably Mellor would agree that we have no reflexive belief but simply a belief, and would go on to argue that in order to correct such a belief we need to add a reflexive belief; i.e. believing (i) 'E is present' and then (ii) 'I am experiencing E to be present' allows us to deny (i) on the grounds of new evidence without thereby calling into question our noetic structure. By turning our attention to our experience we can differentiate between our experience of an event and the event itself.

We might make an analogy with temperature: I walk barefoot across the cold tiles of a bathroom and get into the shower; the water feels very hot against my feet, but then I realise I have set the temperature too low when it feels cool against my chest. I require the belief 'I experience the water to be hot on my feet' in order to make sense of denying the belief 'the water is hot' when I subsequently attain the belief 'the water is cool'. Further reflection may lead me to the belief 'I experience water on my feet to be hotter than it is when my feet are very cold.' Admittedly none of this disproves that we believe events to be present, it simply diagnoses the first part of the reason that we are wrong; the second part is correction of the belief by physical theory.

Craig responds to the physical correction analogy by arguing that 'all this proves is that our basic belief that certain events are presently occurring is defeasible and sometimes defeated.... But just as Mellor is not...prepared to abandon the general veracity and proper basicity of the deliverances of our senses, neither should he abandon the general veracity or proper basicity of our observations of things and events.'⁵⁶⁹ He goes on: 'the fact that under extraordinary circumstances our basic belief in the presentness of some event/thing should turn out to be false is no proof at all either that we have no basic beliefs concerning the presentness of events/things in the external world or that such beliefs are not properly basic.'⁵⁷⁰

We might summarise this argument as somewhat of a dead heat; Mellor's point is that because, apparently, experience cannot fail to be 'present' we have a *prima facie* belief that events are present, but this does not mean we experience presentness *in* events, just that we experience events *presently*. Craig's response is that this is no reason to give up a properly basic belief in the presentness of events; if we experience things presently then most of the time we can assume it matches up to experiencing present things. Perhaps the most we can say is that Craig's comments are unfair insofar as they take Mellor to be disproving *that we have* beliefs in the presentness of things

⁵⁶⁹ Craig, *The Tensed Theory of Time*, p.143

⁵⁷⁰ Craig, *The Tensed Theory of Time*, p.143

rather than simply giving an account of why presentness is not after all something *we experience of* an event.

Given the importance of the concept of the presence of experience in the above discussion, it would be wise to move on, with Craig, to consider Mellor's arguments against the basic belief in the presentness of experience being veridical. The starting point is the contention that we observe our experiences to be present (not as external events, but through introspection), but in fact they are not. 'Judging my experience to be present is much like judging it to be painless' insofar as we cannot be wrong, but therein lies the problem; for, Mellor argues, this renders belief in the presentness of our experiences tautologous, and therefore trivial.

More carefully, then: although the proposition

- (1) 'The experience which I am now having possesses the property of being present'

is not tautologous on a tensed theory, using the B-theory of language from *Real Time*⁵⁷¹ it can be rendered into a different proposition, one which is true but trivial: 'The experiences which S has at the time of the tokening of (1) possess the property of existing at the time of the tokening of (1).'

⁵⁷² This is a rendering of the tenseless truth-conditions of (1), and it shows that, since it would not be possible to have experiences which were non-extant, we gain no information by affirming their existence. Consequently, we cannot conclude anything about the ontology of presentness by citing a proposition affirming the seeming presence of experience, because it is trivially a feature of our experience that it seems present.

There are five criticisms which Craig offers of the argument. The first is that Mellor creates his tautology by stipulating present experiences as present. However, he could simply have used rigid designators or definite descriptions to stipulate the experience; how, asks Craig, is 'My experience of seeing the supernova is present' (a proposition sharing the form of (1)) reducible to a tautology in this way?

In the second place, Craig argues that even the original proposition is not tautologous if considered *de re* rather than *de dicto*: 'If "the experiences which I am

⁵⁷¹ Which is not the most recently developed theory from *Real Time II* which we considered in chapter four. Rather it says that the truth conditions for a sentence can be expressed tenselessly and are all that is required – there are no tensed facts, only tensed beliefs with tenseless truth conditions. If I believe 'I should meet my supervisor in an hour' all that is required is that it is true if I ought to meet my supervisor one hour later than when I token the belief, and false otherwise.

⁵⁷² Craig, *The Tensed Theory of Time*, p.145

now having” picks out certain experiences *de re*, then the ascription of presentness to those experiences out of all one’s experiences across time is not trivial.’⁵⁷³

In the third place, Craig challenges the conclusion of the argument with the tautology granted. He uses an analogy to argue that it fails to show the presentness of experience to be trivial. Citing someone who denies that anyone has any experiences whatsoever, Craig argues that

We might point out to him that we have a basic belief that we have experiences, and perhaps he will admit that this belief is incorrigible. What value, then, would his reply have that

3. My experiences are my experiences.

is tautologous and therefore the belief that one has experiences is trivial?’⁵⁷⁴

Craig argues that, just as the having of experiences is not denied by (3), so neither is the presentness of experiences denied or otherwise explained away by crafting a tautology from (1).

In the fourth place, ‘the stating of tenseless truth conditions for a belief in the presentness of one’s experiences does not constitute even a *prima facie* defeater of that belief.’⁵⁷⁵ Craig argues that the content of one’s belief is not the content of the truth conditions – even allowing that the truth-conditional account is correct – but rather one simply ‘believes that one’s experience has the present tense,’ making the statement of the truth-conditions for the belief ‘just irrelevant to the proper basicity of that belief.’⁵⁷⁶ Craig pushes this further, arguing that unless (1) and (2) meant the same (i.e. unless we support the old ‘translational’ B-theory of language⁵⁷⁷), that (2) is trivial does not show that (1) is.⁵⁷⁸

Craig also argues that Mellor recognises that tenseless truth conditions alone cannot demonstrate the falsity of a tensed theory, because he allows that the B-theorist can give an account of what is happening in the presentness of experience without that constituting a demonstration of the falsity of A-theories – such a demonstration is only

⁵⁷³ Craig, *The Tensed Theory of Time*, p.145

⁵⁷⁴ Craig, *The Tensed Theory of Time*, p.145

⁵⁷⁵ Craig, *The Tensed Theory of Time*, p.146

⁵⁷⁶ Craig, *The Tensed Theory of Time*, p.146

⁵⁷⁷ For discussion and bibliographical resources, see Craig, *The Tensed Theory of Time*, pp.23-65

⁵⁷⁸ Presumably Craig would admit that it is more plausibly irrelevant (to the proper basicity of belief in the presentness of experience) in the absence of good arguments for the mind-dependence of tense. If our purpose is to explore ontology, it is reasonable that a distinction be made between the ontologically tenseless location of a belief and the content and context of that belief. In other words, truth conditions may provide part of an *account* for why we want properly basic belief in presentness and why we are wrong.

supplied by McTaggart's Paradox. Craig reads this as allowing that 'the belief in the presentness of our experience is not defeated merely by the stating of its tenseless truth conditions but remains properly basic until some further defeater is proposed.'⁵⁷⁹

Finally, Craig points out that the B-theory of language expressed in *Real Time* has been (in his opinion) thoroughly debunked⁵⁸⁰, such that there is no viable alternative to the A-theory view of our beliefs in the presentness of experiences. He concludes that Mellor has entirely failed to defeat a properly basic belief in the present resulting from either external or internal events.

It is notable that Craig does not consider Mellor's discussion of the presentness of experience in *Real Time II*⁵⁸¹ – a discussion which takes into account, among other things, the new development of the B-theory of language which Mellor defends in that work. I shall provide some exploration of it below before assessing how it fares against Craig's critical arguments, noted above.

Mellor is clear about the grounds of his discussion: 'When I see a past event, like a solar flare, it is the perceptible fact that my seeing it is present which tells me that the flare must be as far into the past as it is earlier than my seeing it... So the presence of experience is the crux.'⁵⁸² Mellor then constructs an argument as to why it is necessarily true *but not trivial* that the experiences one now has are present, without implying any sort of ontological effects.

Comparing the experience of presentness with the experience of painlessness, Mellor makes an analogous argument about painless experiences first: 'since this now-belief [that my experiences are now painless] is about my *present* experiences, it will be true at any time *t* if and only if all my experiences at *t* are painless.'⁵⁸³ Thus, we do not have to perceive that an experience is painless, or present, but if we reflect on experiences and perceive that they are painless, or present, we are bound to be right. However, 'there is one big, and suspicious, difference between our perceptions of presence and of painlessness. Whereas only some experience is painless, all of it is present.'⁵⁸⁴ We might say to this 'so far so Craig', but Mellor asks us to consider the now-belief 'the experiences I am having are now present'.

⁵⁷⁹ Craig, *The Tensed Theory of Time*, p.146

⁵⁸⁰ In Craig, *The Tensed Theory of Time*, pp.66-96

⁵⁸¹ Mellor, *Real Time II*, pp.39-46

⁵⁸² Mellor, *Real Time II*, p.41

⁵⁸³ Mellor, *Real Time II*, p.43

⁵⁸⁴ Mellor, *Real Time II*, p.44

This now-belief does not ascribe presentness to all my experiences, past, present and future, only to the ones I am having now, i.e. at the B-time at which I have this belief. But their being so located will automatically make this now-belief about them true. So if these B-facts are what make this now-belief true, then it must be true, since its B-truthmakers stop it being anything else.⁵⁸⁵

But experiences are experiences at any time. It is the now-belief that is doing the work of presentness, not the experience. Experiences, then, are just like other events, being neither past nor present nor future, and their being located at times constitute the B-facts which make true tensed (i.e. now-)beliefs about them at those times. One might argue that a ‘discovery’ that whenever I judge my experiences to be present, they are, is no more a discovery of the real inherence of presentness in experiences than a ‘discovery’ that whenever I judge murder to be wrong, it is, constitutes a discovery of the real inherence of wrongness in murders. There are events, and some of them will conform to the definition of murder, and it may be that when I judge such to be wrong I cannot fail to be correct, and that the events which constitute the murder are the truthmakers for the claim that it is wrong, but none of this should persuade us that the events which constitute the murder include a fact of wrongness.⁵⁸⁶

Does Mellor’s *Real Time II* account fare any better against Craig’s position than his original account? On the one hand it seems more successful at breaking the link between a belief in presentness and the ontological ascription of presentness – particularly in concert with the idea that physical theory can correct the ascription of presentness to events in some cases. It defeats Craig’s first counter-argument because it succeeds in reducing ‘My experience of seeing the supernova is present’ to a tautology by giving it the form ‘experience E at *t* is had at *t*’. It defeats the second counter-argument because it admits that picking out ‘certain experiences *de re* out of all one’s experiences across time is not trivial’⁵⁸⁷ but shows that picking them out at the time they occur by ascription of presentness amounts to saying that they occur when they occur, which is tautologous and only saved from triviality by implicitly providing the B-information that certain experiences occur at a specific time (the implication is accomplished by the picking out *de re* – *these* experiences imply *that* location). The fourth and fifth counterarguments are not appropriate to the account in *Real Time II*,

⁵⁸⁵ Mellor, *Real Time II*, p.44

⁵⁸⁶ This is clearly a very difficult example, since how persuasive one finds it will rely in part upon one’s sympathy with certain meta-ethical arguments. However, it is the best analogy I can come up with to illustrate Mellor’s argument without invoking properties or concepts which are directly questionable in the context of presentism.

⁵⁸⁷ Craig, *The Tensed Theory of Time*, p.145

although we might note that they amount to a request for a defence of Mellor's B-theory of language, which we have seen in chapter four to be tricky.

On the other hand, there is the third counterargument which essentially poses the question of whether Mellor's account really eliminates the epistemic force of 'properly basic belief' in the presentness of events and our experiences. It seems that this is a similar situation to that in chapter four regarding Mellor and Craig's demands within the language debate; perhaps, we are tempted to say, it is an acceptable account if we accept B-theory, just as Craig's account is entirely reasonable if we accept presentist premises. In short, Mellor's account says that a properly basic belief in the presentness of experience amounts to a belief that we have experiences when we have them; it unsettles the presentist, but does not overthrow them.

Craig addresses other proposed defeaters of the proper basicity of belief in the present, taking Clifford Williams as an instance of a 'spatial tense' type argument against such belief. The argument proceeds as follows: we experience 'here' in a similar way to that in which we experience 'the present'; the former has no objective status in reality, and therefore neither can the latter have. So our belief in the objectivity of 'now' is as misplaced as a belief in the objectivity of 'here'.

Craig puts forward several points in response. First, he argues that Williams conflates the experience of 'here and now' with the experience of 'here and the present'. The actual content of this point must be constructed from one of Craig's footnotes⁵⁸⁸. Craig is arguing that now-ness, as a mind-dependent, ego-centric phenomenon, is distinct from presentness, since this latter requires no introspective element whereas being aware of now-ness is a reflexive exercise. Consequently, it must be the case that Craig would match 'here' to 'now', and argue that there is no correlate of 'presently' in spatial terms.

His second point is that 'here' may be 'analysed in A-theoretical terms as the spatial location of I-now'⁵⁸⁹, and he adduces to this the various occasions on which Williams employs present-tensed verbs in his characterisation of 'here' as demonstrations of the integral tense elements experienced in 'hereness'. This, naturally, goes some way to explaining why there is no correlate of 'presently' in spatial terms, since presumably Craig would say that any experiences had by the 'I-now' would occur at the spatial location of the 'I-now', and since no spatial location is ontologically

⁵⁸⁸ Craig, *The Tensed Theory of Time*, p.139 n.26

⁵⁸⁹ Craig, *The Tensed Theory of Time*, p.147

favoured there can be no spatial equivalent of the present. Craig argues that if his work on the analogy of spatial indexicals⁵⁹⁰ is correct, then Williams' defeater is undercut.

However, it seems to me that he should not even require a defence of the above analysis in order to get around Williams' argument. Craig's point is that we have a properly basic belief in the presentness of events and experiences; if Williams criticism holds, then we have a properly basic belief in the here-ness of events and experiences. Regardless of either how straightforward these are to defeat or how easy it is to break the link between them and the positing of 'absolute here-ness', there will still be the problem of defeating the properly basic belief in presentness or breaking the link between it and the positing of an absolute present. In short, saying 'I bet you don't have a belief that events are *local*' is not the best way of challenging a belief that events are present.

Craig concludes that, given that he has voided all putative defeaters of the basicity of 'belief in the presentness of things or events'⁵⁹¹, it can be taken that such a belief *is* properly basic. There are two final points that he makes to strengthen his position. First, he argues that

it is hard to imagine how any beliefs could be more powerfully warranted for us than, say, our belief in the presentness of experience ... What argument for the unreality of tense or temporal becoming could possibly be based on premisses more evident than our basic belief in that reality?⁵⁹²

This suggests to us, he claims, that this properly basic belief is an intrinsic defeater of any defeaters brought against it. Second, 'unlike many properly basic beliefs, such as perceptual or memory beliefs or beliefs grounded in testimony, the belief in the reality of tense and temporal becoming is *universal*.'⁵⁹³ Consequently these beliefs are properly basic for everyone, not just for A-theorists who have other arguments for their position, thereby rendering those who reject it (i.e. B-theorists) irrational as a result of having a flawed noetic structure.

Critique of the Argument from the Experience of the Present

My strategy in this critical section of the chapter is as follows: first, to observe that a properly basic belief in the presentness of events/things and our experiences

⁵⁹⁰ Craig, *The Tensed Theory of Time*, pp.97-130

⁵⁹¹ Craig, *The Tensed Theory of Time*, p.148

⁵⁹² Craig, *The Tensed Theory of Time*, p.165

⁵⁹³ Craig, *The Tensed Theory of Time*, p.165

thereof does not equate to a belief in the structure of time as the presentist construes it; this issue will be key throughout the section. Following directly on from this, I will propose a way in which we may have beliefs, which are not corrections by physical theory but spontaneous developments of properly basic beliefs that nevertheless contradict presentism. The consequence is that we can have properly basic temporal beliefs which happily sit side by side with the beliefs Craig supports but which debar the development of a presentist metaphysic as opposed to supporting it. This places some preliminary distance between Craig's epistemic basis and his support of presentism.

In the second place, I will argue that the fact that Craig allows for the limited correction of our beliefs by physical theory is the thin end of a rather sizeable wedge, leading to serious problems for his position. The consequence is that his epistemic grounds are more thoroughly challenged than in the first part of this chapter, and even more distance is placed between his epistemological arguments and his presentist epistemic commitments.

Finally, I will argue that his throwaway use of the specious present to accommodate a properly basic belief in the presentness of events/things/experiences to empirical data hides a major difficulty for his position. In consequence, regardless of any difficulties laid at the door of A-theories in general, the capacity to argue for presentism as an overwhelmingly preferable metaphysical option is seriously curtailed.

Craig arranges his discussion of the epistemology of time in such a way that to debate with him on his own terms is to need to provide either defences of the views he demolishes, or further defeaters of 'the basicity of beliefs in the presentness of things/events/experiences'. However, although this basicity is a necessary epistemic condition of affirming Craig's presentism (i.e. that if presentism is to be true then there is something that is present), it is not a sufficient condition, since presentism also denies existence to anything which is not present. Consequently, we require not simply a properly basic belief in presentness, but also a belief in the non-existence of the past and the future. This already introduces some difficulties for the presentist wishing to pursue epistemic arguments; it is (as we have seen) comparatively easy to introduce belief in the presentness of things, events and experiences as plausibly properly basic, but belief in the non-existence of the past and future is more problematic. In particular, we have a tendency to think of the past as in some way more real than the future (this being one of the draws of views such as Tooley's), but at the end of my analysis of Craig's version of presentism at the end of chapter four, I noted that there is a question mark over whether

his theory can account for this differential. The question of epistemic support for presentism, as opposed to the present, should be foremost in our minds.

As we have seen, Craig allows that in certain cases our physical theories can act as a corrective to our properly basic beliefs; for instance, he says ‘just as to the unaided eye a star which has in fact ceased to exist appears to be present, so the proverbial stick in the water appears to be bent. In both these cases, physical theory serves to defeat and correct erroneous basic beliefs.’⁵⁹⁴ However, here I shall start by arguing for a more primitive correction: his example of physical theory correction is the stick that appears bent in water in fact being straight, but I would argue that we need no *physical theory* to make this correction, although if we have access to the physical theory the correction can certainly be made from it. Rather, I want to argue that we often *develop* (not defeat and correct) our properly basic beliefs spontaneously *a posteriori* (in this case from suitable experience of sticks and water).

Does this play into Craig’s hands? On the contrary, since one of these spontaneous development contexts is that of judging temporal relations on the basis of sound and light perception: if I see a jogger far off in the park on a quiet day, I observe that the sound of training shoes impacting gravel reaches me at a time other than when I see the jogger’s feet impact the ground. From suitable experiences, I realise that the sound I hear does not keep time with what I see; it is past with respect to what I see. This realisation does not have to be a reflexive process. More relevantly, but less obviously unless I work in a scientific context, I learn that if things are far enough away then what I see when I look at them is not what is happening there now, but what was happening some time previous (dependent upon how far away they are). Consequently, my properly basic beliefs are altered to the form that, when I believe things are far away, I also believe that what I am experiencing of them is their past. Do they not thereby cease to be properly basic beliefs because they are based on other beliefs? I argue not: the development of such properly basic beliefs is spontaneous and non-reflexive; I may not even be aware of it. I will now attempt to strengthen and develop this position with respect to Craig.

At this point, someone whose sympathies are with Craig’s position has three options, which I address in turn. First, one could accept that alteration of properly basic beliefs occurs in the way posited: we spontaneously develop properly basic beliefs about experiences at a distance being experiences of the past. Remember that here we are talking about the sort of properly basic beliefs that we develop, and not ‘the truth’;

⁵⁹⁴ Craig, *The Tensed Theory of Time*, p.143

these properly basic beliefs can still be defeated by physical theory, and indeed will be, since as Craig points out we do not instantaneously experience what is happening at astronomical distances, we instantaneously experience the light from them. Nevertheless, without knowing the details of physics we can have the belief that we are not experiencing present events, just as without ever experiencing events at a distance we would retain our belief that all events experienced are present.

How does this help my critique of Craig's epistemology? Because by accepting spontaneous development of properly basic beliefs in this way one would be accepting that we can quite happily develop properly basic beliefs that directly oppose presentism by having among their contents or derivations the belief that the past exists because it can be perceived (since one can easily mistakenly believe that one is looking/listening literally rather than figuratively into the past). Consequently Craig is reduced to the position that while we have no experiences of events at a distance we can be presentists, but after such experiences we can only be non-presentist A-theorists.

What are the alternative options for the presentist? The second option is to accept that such alteration occurs, but argue that spontaneous alteration of properly basic beliefs would actually be in line with correction by physical theory (remember, we are following a different argument here to the one enjoined by considering such correction *simpliciter*). Thus, my new properly basic belief will be that it is still the case that what I experience is present, with the corrective that it takes time for signals to travel, and consequently the present signals I perceive derive from a past moment or event. This runs into a major difficulty: it seems a bit of a stretch to claim that quite subtle facts about the physical universe could be naturally spontaneously accommodated into our properly basic beliefs; for example, in the case of a mirage, is it really the case that people spontaneously incorporate sequential refraction into their properly basic beliefs about visual perception? Surely we just say 'in some contexts we see pools of water that are not really there'.

The third option is to deny that this sort of spontaneous alteration to one's properly basic beliefs actually occurs. One stands by the claim that, universally, people have a properly basic belief in the presentness of all events they perceive, and it is sometimes defeated by physical theory. But again it must be asked whether we undergo this process of a belief's defeat and correction by physical theory. Do I really get confused by the jogger in the park and need to reflect on my beliefs in line with physical theory to correct a belief which has been defeated? Or do I just spontaneously incorporate more information about the world into my noetic structure?

It is also difficult to see why a solipsist properly basic belief is, on this view, ruled out as quickly as we would expect in practice, since if we are disallowing non-physical-theory spontaneous belief development then I have no reason to believe that anything not within my experience exists at all until I am apprised of suitable scientific or metaphysical argument for it. This seems a bit much to accept. So even though Craig says of Mellor's astronomical example that all it proves 'is that our basic belief that certain events are presently occurring is defeasible and sometimes defeated',⁵⁹⁵ nevertheless I would ask why we have to take this position, talking about a properly basic belief being defeated by physical theory, over the position that we have spontaneously adjusted properly basic beliefs about experiencing things/events at a spatio-temporal distance.

Finally, it is notable that many of the spontaneous alterations we make to our beliefs (properly basic or not) are functional but wrong⁵⁹⁶ (i.e. they allow us to operate within the world but do not describe truths about it), whereas many physical theories have apparently counter-intuitive outcomes that we would be unlikely ever to hold as beliefs spontaneously.⁵⁹⁷ Why, then, should we trust our properly basic beliefs as a guide to truth – as opposed to contextual success – and why should we attach *ontological* importance to our having a properly basic belief in presentness? One might also ask why we should think it ought to be accompanied by a belief of the type 'that which we experience as present is all that exists'. In conclusion then, I suggest that the idea of spontaneous belief development (in contrast with explicit correction by physical theory), whilst not removing the possibility that we have properly basic belief in the presentness of things/events/experiences, rather casts doubt on the link between this and presentist metaphysics. We might have properly basic beliefs about perceiving the past, and we might not believe that the beliefs we have about the present correspond to the truth about reality (rather than simply allowing us to function in it).

Moving on to my second main point, I would argue that Craig in fact gives away more than perhaps he thinks by allowing that physical theory can correct some instances of a basic belief in the presentness of an event. For we must keep in mind that what is

⁵⁹⁵ Craig, *The Tensed Theory of Time*, p.143

⁵⁹⁶ E.g. that being cold and catching a cold have a direct (rather than indirect) causal relation; or that there is a 'sod's law' governing the fact that one waits ages for a bus and then two come along at once (which has a physical/statistical basis not related in any way to the person waiting for the bus); or that there is a centrifugal force which throws one out from the centre of a spinning system (whereas in fact there is a centripetal force pushing one in and around).

⁵⁹⁷ E.g. that after a certain height, how far away from the ground you are if you fall will not affect the speed at which you hit the ground; or that it is possible to dip your hand briefly into molten lead without harm, if your hand is damp; or that diamonds, coal and modern pencil cores comprise the same elements, just arranged differently.

at stake for Craig is not the general veracity of beliefs in presentness, as he seems to suggest, but the general veracity of presentism as a doctrine. As it is, Craig argues that if some beliefs can be corrected by physical theory then we are still far from a decisive defeat of a concept of the privileged present. I would like to push against this point using two separate arguments.

First, I will argue that there are corrections by physical theory which not only contextually defeat the belief that some events are present, but which also defeat the belief that the past and future do not exist. Consequently, although A-theories in general may not be epistemically ruled out, presentism is.

Second, the amount of work that our brains do in presenting as a coherent present experience a selection of data which has no such attribute constitutes an argument for the mind-dependence of the presentness of things/events/experience which is prior to other considerations of mind-dependence (e.g. of becoming etc.). In other words, there is a potential empirical defeater for the presentness of experiences as well as events/things.

If physical theory can correct some beliefs about, e.g., the presentness or simultaneity of events, such that this logically contravenes presentism – i.e. that only the present exists as a temporal ontological category – then Craig is in more serious trouble than he has thus far been from arguments against the move from the epistemology of temporal experience to the metaphysics of presentism. He accepts that physical theory can correct beliefs about the presentness of events; what correction might physical theory offer at this point against these beliefs and the belief that only the present exists?

As we have seen, special relativity in its classically developed form shows that the simultaneity of two events can be dependent upon the frame of reference of the observer. This, coupled with the idea that no reference frame is privileged, leads to the result that two events can be ‘present’ – can exist – whilst being temporally separated for some observers; or, that two events which are simultaneous for some observers are in fact temporally separated, leading to the conclusion that at least the temporal span of their occurrence is equally extant. If, as I have argued, the neo-Lorentzian approach Craig adopts is not up to the challenge of providing an alternative to the view that there is no preferred frame or absolute present, then allowing (as seems reasonable) the correction of our beliefs by physical theory appears likely to rule presentism out on broader epistemic grounds as well as on grounds of scientific theory. I noted at the beginning of the chapter that to allow a fair attempt at Counterargument I intended to be

charitable in not assuming that the scientific metaphysic had demonstrated the reality of Minkowskian spacetime, but only provided a reason to believe that no preferred frame or absolute present exists. The above argument is epistemically effective against presentism with just the strength of that reason; I suggest that on the basis of the previous chapter, this makes it significantly effective. Perhaps it does not thoroughly debunk a properly basic belief in the presentness of experience, but this is surely small comfort to the presentist.

Let us turn to the issue of the brain's interpretation of sense data and what it might tell us about the epistemology of the present.⁵⁹⁸ Before I begin I should like to note two things: first, the issue of optimism and pessimism and the question of whether a metaphysical claim is present in an empirically successful scientific theory is not an issue here – at least, not in terms of the use that I am making of the empirical data; if I wanted to say something about the philosophy of mind, this would be a very different story. But this is not about the philosophy of mind, and I am not attempting to demonstrate anything other than some facts about the way we experience things; even if I am a Cartesian mind, my brain represents to 'the real me' certain things in certain ways, and here my interest is in those things and those ways.

Second, and consequent upon the above, it should be clear that this is not an issue akin to the interpretation of relativity theory. Empirical facts may not entail straightforwardly any interesting metaphysical or epistemological view, but the demand for empirical adequacy extends no less to epistemology than to metaphysics: as Craig says, 'if it appears to me that I am in my office reading a book, then it would be improper for me to form the belief that *I see a tree*.'⁵⁹⁹ Likewise, most of the time we would reject the possibility of properly basic beliefs of the sort 'the chord being played on the piano is red', but empirical study of synæsthesia shows that it is possible for a human being to have such a belief (and it would be properly basic in the way 'I see a tree' is). Reporting experiences of synæsthesia is not a question of interpreting a theory; it is simply a question of interpreting experiences. So also for experiences of presentness, simultaneity, etc.

⁵⁹⁸ I am indebted to a (currently) unpublished paper by Craig Callender [Craig Callender, 'The Subjectivity of the Present', http://philosophy2.ucsd.edu/~callende/index_files/Subjectivity%20of%20the%20Present17.doc last accessed 30/09/07] for some pointers in the direction of bibliographical material and directions of argument. The arguments relating to synæsthesia and the uses of the material in criticism of Craig's position are entirely original to me.

⁵⁹⁹ Craig, *The Tensed Theory of Time*, p.136

The argument can be summarised as follows: what we judge to be present not only varies between individuals but also has high ‘plasticity’ for an individual under certain conditions related to our beliefs about what we are causally affecting. Not only can we ‘fill out’ the present, we can also ‘focus it down’. This suggests that the experience of presentness is dependent upon ourselves and is not a ‘reading off’ by us of an ontological category.

I shall take the phenomena in turn. First, Stone (*et al.*)⁶⁰⁰ conducted experiments using paired stimuli of light and sound temporally separated. Subjects were asked to identify whether the stimuli occurred simultaneously. The result was a span of ‘subjective simultaneity’: as well as the basic (intuitively expectable) result that events which were not perfectly simultaneous were judged to be so, the experiment found that some subjects would judge simultaneity to hold within a longer or shorter span than other subjects. Nevertheless, each subject was remarkably consistent in the limits of the span within which they would judge events to be simultaneous. In summary, you may judge two events to be present where I judge one to be present and the other to be past.

This is pushed further by the second phenomenon. Cunningham (*et al.*)⁶⁰¹ asked subjects to move a pointer on a screen using a computer mouse. A time lag was gradually introduced between mouse movement and screen movement; after a while, subjects reported that the two were once again experienced as simultaneous. When the lag was suddenly shut off, for a while they reported the screen-point moving prior to their moving the mouse. Haggard (*et al.*)⁶⁰² claim to show that the intention of the subject actually affects the experience of simultaneity. They found with respect to reported experience ‘that voluntary actions and their effects are attracted together across time, whereas shifts in the opposite direction occur when an involuntary movement is followed by the same effect’⁶⁰³ or, in other words, that when voluntary action is involved cause and effect are temporally ‘contracted’ to bring them within simultaneity, but otherwise ‘expanded’ to be distinguishable.

Dennett and Kinsbourne⁶⁰⁴ discuss phenomena related to the brain’s ability to censor temporal information (such as the time lag between deciding to clench one’s fist

⁶⁰⁰ J. V. Stone, N. M. Hunkin, J. Porrill, R. Wood, V. Keeler, M. Beanland, M. Port, N. R. Porter, ‘When is Now? Perception of Simultaneity’, *Proceedings of the Royal Society B* 268:1462 (2001), p.31-38

⁶⁰¹ D. W. Cunningham, V. A. Billock and B. H. Tsou, ‘Sensorimotor Adaptation to Violations of Temporal Contiguity’, *Psychological Science* 12 (2001), pp.532-535

⁶⁰² Patrick Haggard, Sam Clark, and Jerry Kalogeras, ‘Voluntary Action and Conscious Awareness’, *Nature Neuroscience* 5 (2002), pp.382-385

⁶⁰³ Haggard *et al.*, ‘Voluntary Action and Conscious Awareness’, p.383

⁶⁰⁴ D.C. Dennett and M. Kinsbourne, ‘Time and the Observer’ *Behavioural Brain Science* 15:2 (1992), pp.183-247; see especially p.190 & p.210

and the fist clenching) in order to provide the ‘right’ sense of present action – i.e. we generally experience such things as instantaneous. On the other hand, the present can also be ‘filled out’, as in the case of chronostasis – the experience of a clock, or other object undergoing regular movement, appearing to stop very briefly when one turns one’s attention to it. Yarrow (*et. al.*)⁶⁰⁵ undertook various experiments to show that this is measurable and pronounced: ‘in fact subjects appeared to extend the time that they thought they had seen the first target back in time to approximately 50ms prior to the start of eye movement.’⁶⁰⁶ In other words, we extend the present moment to off-set potential experiential inaccuracies caused by movement of our sensory structure.

The overall argument, then, is that these phenomena act as epistemic defeaters for the belief that events/things are present, both because I may disagree with someone else over what is contained in ‘the present’ and because I can perceive things as present which are not. They also potentially act as a defeater for the belief that my experiences are present, since both the plasticity of presentness and the case of chronostasis mean that I may mistake the presentness of my experiences or their sequence.

The presentist’s response may well be that this does not remove the properly basic belief that my experiences are present – just as Mellor giving an account of the presentness of experiences being tautological did not remove that belief – even if it is effective against the view that events/things are present. The plasticity or flexibility of presentness with respect to my experiences does not, Craig might say, detract from the point that when I have them they seem present to me. However, the argument I have just given has an advantage over Mellor’s account, in that it places the properly basic belief that my experiences are present on (roughly) the same epistemic footing as the properly basic belief that the piano chord just played was red: that the piano chord is given to me redly is no reason to think that sound is really coloured as opposed to just being sound; that my experiences are given to me presently is no reason to think that they really are absolutely present as opposed to just being experiences.

To summarise key points thus far: if we have spontaneously developed properly basic beliefs, then we may have properly basic beliefs which block the move from our experience of things/events/experiences as present to a belief in presentism. Further, if we allow the correction of beliefs by physical theory then belief in presentism may be ruled out on epistemic grounds derived from science. Moreover, physical analysis of

⁶⁰⁵ Kielan Yarrow, P. Haggard, R. Heal, P. Brown, and J. C. Rothwell, ‘Illusory Perceptions of Space and Time Preserve Cross-Saccadic Perceptual Continuity’, *Nature* 414 (2001), p.302-305

⁶⁰⁶ Yarrow et al, ‘Illusory Perceptions of Space and Time Preserve Cross-Saccadic Perceptual Continuity’, p.303

how we experience things in relation to temporality may lead to large-scale defeat of our basic belief(s) in the presentness of things/events and even experiences; at any rate it opens a gulf between such beliefs and the attribution of an absolute present as required by Craig for his presentist metaphysics.

There is a response which Craig can give to all the examples of physical theory correcting our view of beliefs in the present:

in most cases, the things and events we observe are contained within a brief temporal interval which is present, for example the so-called “specious present,” and our basic belief that “E is presently occurring” makes no reference to instants, so that such a belief remains properly basic even for scientifically educated persons like ourselves.⁶⁰⁷

In the final critical part of this chapter I will argue that this is emphatically *not* a response he should opt for as a way of saving his presentist project.

We can begin by recalling the discussion of the specious, or ‘elastic’, present at the end of chapter four. The core of Craig’s position can be expressed by the following: ‘We can maintain that the extent of the present depends upon the extent of the entity described as present.’⁶⁰⁸ We can note immediately that this is more expansive than the contention that we can adapt our epistemology of the present to physical theory (‘in most cases, the things and events we observe are contained within a brief temporal interval’). The criticism made of Craig’s ‘elastic present’ in chapter four could be summarised thus: if events which require large durations can be considered present, even if divisible down to an instant, and presentism says that only what is present exists then there is a big question over what in fact exists. If one expands the event and duration under consideration – say, the present universe – then it is unclear how the resultant view of ‘only the present existing’ differs *ontologically* from a B-theoretical view, except insofar as one might posit an extra property of presentness which inheres in all events/things. This latter is represented by Smith in *Language and Time*, and Craig makes it clear this is not a view which he accepts.⁶⁰⁹

I suggest there are actually two main problems for Craig’s position now: first, the problem from chapter four, canvassed already above; and second, an epistemic problem of what our properly basic beliefs about the present are. For if Craig is allowing that properly basic beliefs about the present are adapted to physical theory by the specious present, and if he does not place suitable constraints on the latter (which he

⁶⁰⁷ Craig, *The Tensed Theory of Time*, p.143

⁶⁰⁸ Craig, *The Tensed Theory of Time*, p.245

⁶⁰⁹ Craig, *The Tensed Theory of Time*, p.82-83, for example.

does not appear to) then he seems committed to the view that we can have a properly basic belief in the presentness of 'the present stage in the evolution of the sun'⁶¹⁰ understood as the duration being present, rather than as the more charitable view that the event is co-occurrent with my belief.

Let us take the more charitable case first, in case anything can be salvaged from it. 'An event E of duration d is present' means that the belief 'E is present' is true at any moment of time in d . We might see this as restricting the scope of presentness to E and selecting the duration as a logical domain; thus, of every time in the domain it is true that E is present. When I say 'Wimbledon is happening this (i.e. in the present) fortnight', I simply mean to refer to the tennis that is occurring at the time of discussion. This is quite sensible and fits with how we use the language of presentness for long durations. However, it relies on matching the time of my assertion with the event of Wimbledon and checking that both the time and the event fall within the duration specified. This sounds suspiciously like a B-theory type account of my belief, making talk about beliefs, events and durations into talk about their tenseless relations. We have seen no evidence to suggest that Craig desires such an account of my belief in the presentness of long-durational events, and none to make us think that it would be welcome to him. It also suggests that it would be as compatible with a B-theory ontology of time as with a presentist ontology, if not more so. Finally, in the logical structure of domain and property scope which I posited above it appears strange and arbitrary that E has presentness at every time in the domain d .

The second option, then, would be that a belief that 'an event E of duration d is present' constitutes a belief in the presentness of d . Here one might posit that the scope of presentness is inclusive of both E and d , in order to illustrate the difference logically. What can be said of this option? In the first place, it is not clear that people have such beliefs in the same way that they have beliefs in the presentness of reading this sentence, for instance. It seems far more reasonable to think that this week is present in the derivative sense that I recognise the presentness of my reading this sentence occurs within a certain span of time which I can freely select out of many possible spans of time.

In the second place, if people somehow do have such beliefs it is not clear that they are properly basic; rather it seems likely that they depend upon a properly basic belief in the presentness of experience, for example, with an additional temporal projection. But this temporal projection relies on a B-theoretical intuition; what else

⁶¹⁰ Craig, *The Tensed Theory of Time*, p.245

could the content of a belief that this week is present rely on if not the idea that the bits of ‘this week’ that I do not currently experience are nevertheless ‘there’, if only as entertained in my imagination?

In conclusion, we could summarise the arguments as follows: if we are talking about presentist ontology, an ‘elastic present’ concept potentially undermines the whole enterprise, as we saw earlier in the thesis. If we are talking about properly basic belief in the presentness of experience/events/things, an elastic present leads to noetic structures which are just as plausibly B-theoretical as presentist, if it does not render such beliefs inadmissible as properly basic in the first place. An elastic present is not, therefore, a good way to get around problems posed by physical theory for a presentist epistemology – i.e. for the view that the past and future do not exist – because the ontological and interpretative strain placed on the resulting position makes it very difficult to use it as a basis for presentist metaphysics.

Before drawing the chapter to a close, something needs to be said on Craig’s charge of irrationality; we recall that Craig accused B-theorists of irrationality insofar as they deny a properly basic belief that is universal to all people and therefore rational for all people. Even if my arguments to date have not succeeded in dislodging the proper basicity of a belief in the presentness of experience/events/things, but only in showing that such belief can regularly be defeated and should not in any case lead to a presentist metaphysics, still we can certainly defend the B-theorist against the charge of irrationality.

Could Craig’s view of our tensed beliefs (and their proper basicity) be compared to a belief that the earth is flat? After all, a spirit level will generally tell us that it is, and if we take calculus seriously then we must allow *at least* that an infinitesimal section on which we stand can be treated mathematically as flat. Nevertheless, patently the Earth is approximately spherical. Yet this is not something that the typical ant, for example, will ever have any chance of comprehending. Does it thereby follow that *we* ought to affirm with the ant a properly basic belief that the Earth is flat? Surely not; we have physical theory to help us defeat such a belief. Is the super-intelligent ant who develops conceptual and linguistic structures to cope with a spherical Earth irrational? Perhaps, but not *wrong*.

By analogy, I would argue that even if it seems irrational for us to attempt to develop conceptual and linguistic structures which deny the ontological primacy of ‘the present’, it does not mean that we will be *wrong* to do so. Given that physical theory provides us some reasons, at least, for thinking that we *may be right* to do so, then we

are not really irrational to do so. To develop a previous example, the person with synæsthesia who lives in a closed society in which everyone has synæsthesia has a properly basic belief (shared by everyone) that, e.g., B-flat major chords are experienced redly. That person is not necessarily irrational to pursue an account of the world in which B-flat major chords have no real colour, because it is plausible that everyone's properly basic belief does not accurately describe reality. The more physical theory gives reason to doubt the link between properly basic belief and reality, the more rational it is to explore the alternatives. I conclude that B-theorists are quite within their epistemic rights to pursue their theories.

Where does the critical section of this chapter place us within the overall debate? We can certainly admit that beliefs about presentness have a powerful position in our noetic structure. However, I have argued that this does not translate into truths about things, events and experiences being (in a real and absolute sense) present. Neither does it translate into the more tenuous metaphysical claims that the past and future do not exist and that presentism is true.

Why do we persist in having these beliefs about presentness? For the same reasons that we persist in having beliefs about centrifugal forces and being cold giving us colds: because it is useful and sometimes because it approximates reality. It is useful to make assumptions about presentness (or, from another point of view, subjective simultaneity) because it means not having to make constant corrections that do not matter in the world of medium-sized dry goods. On the other hand, it is useful to experience chronostasis so that we have better opportunities to analyse moving systems that we interact with. It is useful to assume that rotating systems 'throw us out from the centre' – until we have to design safety systems for fairground rides.

Whether or not we are B-theorists or A-theorists, however, is not about being useful; we are trying to work out what ought to be included in a description of reality. To this end, I suggest that Craig has not given us the overwhelming philosophical argument(s) necessary to complete the strategy of Counterargument or persuaded us that, irrespective of what contemporary science says about preferred frames of reference or the structure of space-time, we should be presentists. In the next chapter I shall discuss what the failures of Undermining and Counterargument in Craig's case mean for the wider debate of A-theory versus B-theory, how it shapes the system of constraints for the methodology that I am advocating, and which philosophical foundations it might suggest to the defender of divine timelessness.

Chapter VII – Philosophical Foundations: Temporal Ontology and the Divine Nature

Introduction

Over the last three chapters we have seen a complex of arguments concerning language and ontology, science, and epistemology, all in relation to the debate over the importance of ‘the present’ in our philosophical description of reality. In terms of the broadest distinctions, more scientifically reliant material has been bracketed by what might be considered ‘independent metaphysical arguments’. However, a more sophisticated structure has also been at work. Having identified presentism (as the view that the present exists while the past and future do not) both as the fastest way around McTaggart’s paradox and as the metaphysical view most likely to constrain theology to the point of concluding that God is temporal, we have seen the presentist arguments of chapter four (regarding language and ontology) to be independent arguments which would support a process of Undermining – i.e. to be more successful if the presentist could establish a level scientific playing field. The arguments of chapter five concerned the attempt to establish just such a level scientific playing field. Chapter six, on the other hand, concerned arguments that would support a process of Counterargument – overwhelming independent claims for the ontological uniqueness of the present which would still hold in the face of the difficulties of the previous two chapters. These, too, were subject to severe criticism.

The time has come to return to the bigger picture and ask what impact all of this has had within our methodological concerns. What sorts of constraint are formed for the theology of eternity? What philosophical foundations for a defence of divine timelessness will arise from such constraints? The content of this final chapter is as follows: First, I recapitulate the flow of discussion from science to metaphysics and through to theology. Second, I provide a brief account of what has and (just as important) has not been settled by the previous discussion. Third, I characterise this in terms of philosophical foundations and constraints that are formed for a defence of divine timelessness. Fourth, turning to theology I provide examples of these constraints in action, and address issues from theology and philosophy of religion which are not affected by or reliant on the constraints but which might constitute philosophical foundations of a defence of divine timelessness.

Constraints and Foundations in Summary

We saw in chapter three that the B-theory and divine timelessness were inextricably linked, as were the A-theory and the view of divine temporality. Two things were of note: first, that it was the status of the present which had the most impact; if the present moment was held to be all that existed, and the past and future were non-existent, then divine timelessness would be nigh on impossible to defend. Second, the major defence of divine temporality by Craig relied upon a defence of just this sort of presentism and was therefore a main resource for the debate. If Craig's arguments for the ontological importance of the present carried through, the constraints placed upon the theology of divine eternity would in all likelihood remove the option of a defence of divine timelessness.

Consequently, we saw, the philosophical foundations for a defence of divine timelessness must centre upon a denial of the ontological importance of the present as construed in presentist metaphysics, leaving the way more open for the development of B-theories of time which could form their own constraints on the theology of divine eternity – in favour of divine timelessness.

We also saw that, in terms of Hawley's schema, the B-theory has a claim to be a 'scientific metaphysics' – i.e. that there is a *prima facie* case to suggest that the present is not ontologically favoured, which receives some support from contemporary science. Consequently, A-theorists – especially presentists – need to pursue a strategy of Undermining or Counterargument: either levelling the scientific playing field by showing that their position is scientifically tenable and/or that there is not scientific support after all, so as to give more force to independent arguments, *or* finding an overwhelming argument in favour of presentist metaphysics that outstrips any scientific considerations brought to bear. Successful Undermining or Counterargument, then, would establish the ontological importance of the present and give the upper hand to the A-theorist (including non-presentist A-theorists, who would generally stand to gain from arguments demonstrating the importance of the present). This in turn would make it difficult to conduct a defence of divine timelessness.

Fortunately for the defender of divine timelessness, neither of the strategies met with success; no arguments were successfully upheld to secure the ontological importance of the present or the victory of a presentist metaphysics *à la* Craig. The task now is to show what conclusions can be reached, in terms provided by the

methodological structure of the thesis, and therefore which philosophical foundations are emergent for the defender of divine timelessness.

Mellor's *Real Time II* account, which demands a proposition P to be indexed to a time t , makes more sense if there is no preferred frame of reference and no absolute present. Truth-makers for tensed propositions will have to be indexed to frames of reference and times related to observers and observations. This is perfectly plausible within Mellor's structure. Consequently, the failure of Craig's neo-Lorentzian approach to provide a scientific basis for a presentist metaphysical system means that there is a reason to arbitrate in favour of Mellor's B-theory account of language, rather than Craig's presentist account of language. This provides, therefore, a philosophical foundation for a defence of divine timelessness by providing a basis from which to defend an indexed B-theory of language – an important element of a B-theory, and thus a component of the constraints and resources placed on divine eternity if a B-theory is successful.

Sider argues that the presentist must be unduly reductionist about cross-time spatial relations, and that accounting for the grounds of facts about the past is problematic, presentist options leading to an insufficiently robust ontology. This lends some support to a B-theory of time, but would also be compatible with A-theoretical models which do not deny the reality of the past. Thus, the criticisms by Sider do work primarily on weakening the A-theoretical position by ruling out the presentist end of the A-theoretical spectrum.

We saw that Craig's own model of presentism was highly problematic. This in itself is an important step in setting aside presentism as a viable ontology and closing the door further on divine temporality. However, we also saw that at certain points Craig's model was in danger of collapsing into what looked more like a B-theory – particularly with respect to the 'elastic present' and his account's seeming inability to distinguish properly between the past and the future, ontologically, as well as potentially in the areas of cross-time relations and quantification. We could choose to take this as circumstantial evidence for the B-theory as a reasonable alternative to presentism.

In the discussion of science, I chose to adopt a cautious position rather than presume a level of support which does not necessarily obtain. Thus, I centred consideration on the denial of an absolute frame of reference and absolute present. As well as thereby avoiding extended debate over how far we should be realists over (e.g.) the Minkowskian interpretation of relativity – an issue, among several, which the B-

theorist and defender of divine timelessness may need to deal with in due course – this also enabled me to concentrate on the core issue with respect to presentist metaphysics, in both chapters five and six. I have already concluded that the strategy of Undermining cannot be completed by Craig, and it is clear that this adds further damage to the presentist position in addition to the factors we have considered so far. However, the material in chapter five has a wider importance, since support of a neo-Lorentzian physics is an important step in the Undermining strategies that could be followed by other A-theorists (for example, DeWeese cites it as an important factor in relation to his support for Tooley's theory⁶¹¹). Thus, the arguments and conclusions of chapter five may be considered an important philosophical foundation for a defence of divine timelessness, insofar as they count against A-theories of time in general and thereby deny the move from an A-theory to a theological constraint in favour of divine temporality. We should note that the more successfully the B-theorist can argue for more extensively realist interpretations of Minkowskian relativistic physics, the more support is garnered for Sider's arguments against presentism and in favour of four-dimensionalism, the natural bedfellow of B-theories in the area of persistence. Consequently one might suggest, in view of Hawley's arguments concerning an optimistic approach to science as a guide to metaphysics, that the B-theorist and defender of divine timelessness may be better off defending a cautious form of scientific realism – understood at least as a commitment to the view that better scientific theories give us a better chance at describing reality.

It is important to note, however, that my arguments do not rely upon a naïve realism about Minkowskian relativity – I am not, as Padgett puts it, 'confusing the logical with the physical ... the mathematical (for example the Minkowski diagram) with the physical',⁶¹² because I am not simply 'assuming the *sufficiency of the Special Theory of Relativity for ontology*, in particular the theory of time'⁶¹³ in the sense that Padgett intends – i.e. I am not contravening the wisdom of Hawley's 'acceptable pessimistic core' by thinking that empirical data straightforwardly entails interesting metaphysical theories. Rather, I am arguing that special relativity theory provides some reason to think that there is no absolute present, that the neo-Lorentzian approach does not provide so easy an alternative as one might think, and (following Balashov and Janssen) that the Minkowskian interpretation of special relativity provides a better explanation for Lorentz invariance than the neo-Lorentzian approach. So I do not

⁶¹¹ DeWeese, *God and the Nature of Time*, p.72-3

⁶¹² Padgett, *God, Eternity, and the Nature of Time*, p.121

⁶¹³ Padgett, *God, Eternity, and the Nature of Time*, p.92

assume that this is sufficient for ontology, I provide arguments for it; and the conclusions reached are not sufficient for a *complete* temporal ontology, only for the ontological job required: supporting the denial of the ascription of an absolute present and preferred reference frame to reality.

In the area of epistemology, the primary concern was to block the strategy of Counterargument, which would have potentially allowed the assertion of a presentist metaphysics in the face of the criticisms of chapters four and five. This block was obtained in two ways: first, by breaking the link between belief in the presentness of things/events/experiences and belief in presentism, and second by weakening the link between belief in the presentness of things/events/experiences and belief in the ontological importance of the present.

The former was aided by the possibility of physical theory (in the form of relativity as discussed in chapter five) defeating belief in presentism, and the argument that our beliefs have the potential to contradict presentist denials of the reality of the past, as well as the weakness of Craig's own theory in accounting for our intuition of the difference between the past and the future. The latter was aided by appeal to certain scientifically investigable phenomena to do with our perception of the world and of time, and the argument that different spans of time may be experienced, or determined, as present. Experiencing something 'presently' is not an airtight reason to ascribe ontological value to the concept of the present; there is room to pursue an argument of 'mind-dependence' for tense.

We saw, then, that a B-theoretical account was available for the presentness of experience, both from the angle of mind-dependence and from the angle of language and ontology, although the latter offers a 'coherence' account, ideally requiring separate reasons for holding a B-theory.

What can we say about philosophical foundations, in summary? The core can be expressed negatively: the denial of ontological favour to 'the present'. It is this, above all, which will secure a philosophical position that keeps theories of eternity free of constraints barring the development of concepts of divine timelessness, and which may allow the introduction of constraints barring the development of concepts of divine temporality. There are more detailed elements, some of which support that basis and some, perhaps more tenuous, which derive from this basis.

The basis of the position is in methodological terms: the demand for empirical adequacy and the view that empirical data does not straightforwardly entail interesting metaphysical claims; the idea that an empirically successful scientific theory may

(challengeably) support a metaphysical claim involved in it; the concept of a logical constraint upon theology that comes from outside of its own domain of discourse. These have interacted to form the context of arguments against the ontological favouring of the present.

Derivative considerations have been in the direction of B-theoretical views: in the realm of language and ontology, a commitment to tenseless facts as truth-makers for both tensed and tenseless beliefs, propositions (etc.); the concept of ‘ontological equality’ across all moments of time, and the idea that our perception of temporal inequalities is rooted in our status as observers with perspectives and interpretative modes of experience.

Having covered these elements, there are two important questions left to answer: first, how does all of this actually work when it comes to arguments about divine eternity? Second, are there any candidates for major philosophical foundations which come from ‘within’ the theological domain – i.e. are there considerations about God which can form logical constraints on what we say about God and time? In the remainder of this chapter, I will address these issues: in the next section I will show how we can analyse some examples of ‘arguments for divine timelessness’, and their critiques, in a constructive and diagnostic fashion, showing their proper resolution to be dependent upon the arguments of this thesis. In the final section I shall look at two arguments for divine timelessness that give us potential insights into ‘independent’ philosophical foundations that might be developed, but which still fit within the broadest structure of constraints that I am proposing.

Examples of Arguments Dependent Upon the Main Constraints of the Thesis

In chapter three we saw arguments concerning the ‘match’ of B-theoretical views of time with divine atemporality, and of A-theoretical views of time with divine temporality. These naturally provided some limited examples of arguments in favour of divine temporality or atemporality which could be shown to be reliant upon the relevant constraints of philosophy of time. However, here I want to consider arguments whose problems or unforeseen complexities might be diagnosed using the methodological resources of the thesis. In other words, what insights are available from the contents and relations of scientific, philosophical and theological material that we have been discussing, when it comes to identifying underlying issues of importance for arguments in the divine eternity debate?

Below, I look at two arguments for divine timelessness provided by Leftow, and the criticisms of them given by Craig. The first is an argument from the view that what is temporal is also spatial; the second is an argument concerning knowledge of the past.

Leftow makes an argument for divine timelessness based on the idea that modern science has shown that what is temporal is also spatial⁶¹⁴. He begins by stating that we should, and do, deny that God has a specific location in space (we do not get closer to him by physical movement) and that we should deny that omnipresence entails literal physical location in all points of space (it does not make sense to say that we literally walk through God every time we walk anywhere). Rather, Leftow's 'Zero Thesis' entails that God is contiguous with every point in space and occupies none of them. This interpretation of omnipresence need not detain us: it is sufficient to note that Leftow believes he can accommodate omnipresence without asserting that God is spatial.

The meat of the argument centres on Leftow's acceptance that 'according to contemporary physics, only spatial things are temporal.'⁶¹⁵ He is willing to put this as strongly as 'something has a location in time if and only if it has a location in space.'⁶¹⁶ This results in the argument that if God is temporal then God is spatial as well; we do not want the consequent, so we must reject the antecedent. The basis of this argument is clearly whatever Leftow takes contemporary physics to have shown. His understanding is as follows:

Contemporary physics treats time as one more extensive dimension in addition to the dimensions of space (whatever else time may be). Now whatever is located in one dimension is ipso facto located in all other dimensions of the same continuum... So if it is correct to represent time as another dimension, it follows that whatever is in time is also in space.⁶¹⁷

So the argument is that if God can be located temporally then God can be located spatially – whether we like it or not, as it were. Since we do not like it, we should not claim God is temporal in the first place. What responses are available to this argument, and how does the material of the foregoing chapters shed light on it?

Leftow himself considers two critical options, based on the view that God is temporal, but 'not in a time that is a fourth dimension of an extensive continuum.'⁶¹⁸ The first option is to argue that God's time is separate from our time; the second option

⁶¹⁴ Leftow, *Time and Eternity*, p.271

⁶¹⁵ Leftow, *Time and Eternity*, p.227

⁶¹⁶ Leftow, *Time and Eternity*, p.271

⁶¹⁷ Leftow, *Time and Eternity*, p.35-6

⁶¹⁸ Leftow, *Time and Eternity*, p.272

is to argue that our time is not actually as contemporary physics describes it. Leftow argues that the first option is unattractive because we cannot say when God acts, and because he has previously argued that separate time series cannot causally interact. He identifies the second option as the greater threat.

Leftow's response to the tactic of challenging contemporary physics' description of the world (as he sees it) is twofold. First, he says:

that the finite speed of light *reveals to us* that simultaneity is relative does not entail that simultaneity is relative only for beings who depend on physical signals for their knowledge. One can say instead that the finite speed of light shows us that space and time have a certain structure, that this structure accounts for the relativity of simultaneity, and that if space and time do have this structure, they have it objectively⁶¹⁹

and, second, that having to deny that relativity theory is literally true in order to support divine temporality shows that the original argument is effective.

Craig objects strongly to these replies, complaining that Leftow is making huge metaphysical assumptions by taking relativity theory in its standard interpretation as 'literally true' as a description of reality. He argues that we can straightforwardly see that a non-spatial temporal series is possible by considering a sequence of mental events generated by God prior to the creation of physical time and space.

I contend that the argument provided by Leftow is not going to do any work for the defender of divine timelessness independent of the methodological considerations of this thesis. He implicitly acknowledges the key issue when he says that an 'object with a space-time location is a physical object. Hence if the time in which God exists is the same physical time in which we exist, then God is a physical object with a spatial location.'⁶²⁰ This immediately raises the question of metaphysical time, since even if we were to go back to a Newtonian description of time and space it would be possible to say that there is physical space and physical time and if God is in either then God is a physical object, which presumably (in line with classical theism) we do not wish to affirm. In the Newtonian system, as we saw in chapter five, we can still have absolute space and time. So the real issue must be the relationship between physical and metaphysical time. By assuming 'the literal truth' of relativity theory, Leftow is leaving himself open to a charge of naïve realism. By insisting that his defence of divine timelessness is independent of the A-/B-theory position one holds, he is robbing himself

⁶¹⁹ Leftow, *Time and Eternity*, p.272

⁶²⁰ Leftow, *Time and Eternity*, p.36

of the resources to resolve the issue of the nature of (metaphysical) time and its relation to physical time.

My suggestion, then, is that the only way for Leftow to conduct an argument in the terms that he desires (spatiality and temporality) is to consider the issues as I have presented them in this thesis – unless he simply wants to make the point that God is not a physical object and therefore is not inside of the structure of time and space that our physical theories describe. Any attempted move directly from relativistic science to divine timelessness is liable to be mauled by critics such as Craig unless it can circumvent the obstacle of ‘metaphysical time’. I argue on the basis of the preceding chapters that the most cautious way to do this is to take the empirical success of relativity theory as *a* reason to reject the concept of an absolute present as an integral part of a metaphysic of time, thereby making a B-theory more appealing (among other effects). A more risky strategy is to argue for some sort of space-time realism, but even that option will not secure the result that Leftow urges with the immediacy he supposes possible, given the extent of the effort required to attain such a position in the first place. In any event, it seems unlikely that one could make Leftow’s *specific* argument regarding spatiality and temporality at the metaphysical level, since the metaphysics of space and time are not geometrically dependent. So Leftow’s specific argument is effectively eclipsed by the issues that I have raised above.

Under the heading ‘timelessness and perfect knowledge of the past’, Leftow constructs the following argument.

- 1) God is the perfect knower
- 2) The best justification for knowing beliefs is direct cognitive contact.
- 3) A timeless God has direct cognitive contact with what is past for us.
- 4) A temporal God has indirect cognitive contact with the past through memory.
- 5) If God is temporal, but possibly timeless, God’s mode of knowledge of the past is less perfect than it could be.
- 6) God is possibly timeless.
- 7) If God is the perfect knower, God is timeless rather than temporal.
- 8) Therefore God is timeless rather than temporal.

Craig provides, essentially, two responses. First, he says that an omniscient God does not have the restrictions that humans have when it comes to knowledge of the past; what was experienced as present for God remains just as vivid and complete. Second, he

attempts to turn the argument around, reasoning that if it is more perfect to be in direct cognitive contact with events, we should affirm divine temporality. He asks ‘what does it mean for a timeless God to be in “direct cognitive contact” with past events? They are not past for Him since He is timeless. So He must know them only as past in relation to us.’⁶²¹ What Craig is aiming at here is the idea (which we saw in Chapter 4) of irreducible tense. The argument for comparison would be as follows:

1. God is timeless.
2. God is omniscient.
3. A temporal world exists.
4. If a temporal world exists, then if God is omniscient, God knows tensed facts.
5. If God is timeless, He does not know tensed facts.

Since (2) is essential to theism and (3) is evidently true, (1) must be false.⁶²²

Craig admits that by subscribing to a tenseless theory of time the defender of divine timelessness can argue that by knowing all the tenseless facts God is perfectly omniscient (thus debunking (4.) above). However, Craig is playing this for an advantage against Leftow, and consequently it appears that he is trying to suggest that ‘direct cognitive contact’ is more direct if one is in the same mode of temporality as the object of cognition. Once again we find the same tensions resurfacing: is Craig saying that Leftow’s argument is faulty because there are tensed facts which necessitate an omniscient God being temporal (and hence able to be in direct cognitive contact with facts in the right way – i.e. a tensed way)? Is Craig saying that temporal direct cognitive contact is superior because God would know what it is like to know something as past? If the latter, it is difficult to see how a temporal omniscient God is advantaged, given that Craig’s other counter-argument is that omniscience provides perfect memory, so that God would not have the usual human experiential content of something being past apart from the factual knowledge that it was ‘before now’. But the first option leaves open the possibility of supporting a tenseless view of time in which there are not tensed facts. So despite an apparent deeper criticism, all we are left with is simply that there are tensed facts or not.

However, in the circumstances this is precisely the issue. Leftow picks it up again in his chapter on omniscience⁶²³, and it is clear from that discussion that, although

⁶²¹ Craig, *God, Time & Eternity*, p.39

⁶²² Craig, *God, Time & Eternity*, p.115-6

⁶²³ Leftow, *Time and Eternity*, pp.313-337

he claims to rescue omniscience and divine timelessness for the case in which time is tensed, he nevertheless relies upon moves which are more aptly made in defence of a B-theoretical position. In particular he says, for example, that the difference in content between tensed facts and their tenseless counterparts derive only from the mode of access knowers have to tensed facts. Consequently:

even if I never know that it is now 3 P.M., if I know all other facts about 3 P.M. and also know that it was *then* 3 P.M. ... I know all the facts about 3 P.M. For I know a truth based on and expressing the [tensed] fact which expresses it as fully, and is as close in content to "it is now 3 P.M.," as is possible at times other than 3 P.M.⁶²⁴

Craig points out in response to this position:

The fact that renders such a proposition true must therefore be tenseless, even if that tenseless fact generates a tensed proposition at 3 P.M. Since there are no facts that escape God's omniscience and the only temporal facts God knows are tenseless facts, it follows that tensed facts do not exist.⁶²⁵

Or, more correctly given Leftow's view, do not exist *after all*, since what was proposed as a tensed fact is, if Craig's diagnosis is right, actually just a tensed belief.

Putting aside Craig's observation that 'at any rate Leftow's explanation of God's knowledge of tensed facts is system dependent upon his theory of divine eternity',⁶²⁶ we can see from the (necessarily) limited material above that an approach predicated on the denial of tensed facts (and more importantly of the ontological favouring of the present) as enabled by the structure of this thesis is more likely to meet the challenges facing Leftow's position.

This point can be made all the clearer when applied to a more fundamental manoeuvre which he makes in defending his view. Bringing relativity theory in once again, he argues that because the present is relativised to frames of reference, tensed facts are framework-relative. Thus:

a timeless God can know all the facts of simultaneity that obtain in other reference frames. Thus He can know what the essentially tensed facts of these other reference frames are, though He cannot be directly presented with these facts.⁶²⁷

⁶²⁴ Leftow, *Time and Eternity*, p.336

⁶²⁵ Craig, *God, Time, and Eternity*, p.125, in the context of the wider argument of pp.112-126

⁶²⁶ Craig, *God, Time, and Eternity*, p.126

⁶²⁷ Leftow, *Time and Eternity*, p.334

As Craig points out, if we are assuming that there are tensed facts then what God knows is the collection of simultaneity relations for every frame or observer, but ‘He cannot know *what* point on the world line of that observer or *which* simultaneity class of events is *present* in that frame.’⁶²⁸ Consequently God cannot really know tensed facts; we might add (to match up with the previous criticism of Leftow on tensed facts) that what God knows is the location and simultaneity relations of all tensed *beliefs*, but this is only useful if we first support a tenseless theory of time in order to affirm that there is no absolute present (frame relative or otherwise) of which God requires knowledge.

In summary, it seems that Leftow’s arguments here *either* rely on accounts of facts that will ultimately demand a B-theoretical approach to be effective, *or* on moves employing relativity theory that will ultimately demand greater care over use of those scientific resources (to help deny the possibility of an absolute present being affirmed metaphysically), if not outright comprehensive rejection of A-theoretical positions in favour of B-theoretical ones. Once again, my argument is that, for the defender of divine timelessness looking for firm foundations, a grasp and suitable use of the structures I have tried to develop in this thesis eclipses piecemeal defences of arguments such as those I have discussed in this section.

Arguments Independent of the Main Constraints of the Thesis

In the previous section I gave examples of arguments where the substance (methodological and otherwise) of the previous chapters demonstrated where certain problems arose, and allowed us to see how an approach in line with the structure of constraints that I have developed would provide a more sensible course of action for the defender of divine timelessness. In this section, I want to address two major arguments where, for various reasons (to be explored), the issues are comparatively independent of previous material and may need to be incorporated into the philosophical foundations of a defence of divine timelessness. Nevertheless, I intend to show that the arguments still fit within the wider structure of constraints that I have argued for, being examples of cases where there are logical constraints formed within theology as a result of other (philosophical-theological) commitments that one may take on.

This has echoes of concerns expressed in the first chapter, where we saw that, historically, there are issues which are more clearly theological without necessarily depending upon external philosophical arguments to form them. However, stripped

⁶²⁸ Craig, *God, Time, and Eternity*, p.125 (my italics)

back to premises which must be defended with philosophical rigour, they may well qualify as suitable philosophical foundations for a defence of divine timelessness. The arguments concern, in the first place, God as a necessary (or perfect) being, and, in the second place, the idea of the divine perfect life (the roots of which can be seen in Boethius' discussion of eternity as, among other things, 'perfect life'). The potential philosophical foundations they give rise to therefore concern divine necessity, the nature of the divine life and correlatively the distinction of transcendence and immanence.

Leftow puts forward an argument that necessary existence entails timeless existence for God. He turns to the concept of divine perfection first, to argue that the importance of 'security of existence' is such that we can say that if a perfect being exists, its perfection requires that it necessarily exists. From this and the premise that time is contingent, Leftow derives the argument that what exists necessarily, exists timelessly; God must, as a necessary being, therefore be timeless.

Craig construes this argument as follows:

- 1) God exists necessarily.
- 2) Time is contingent.
- 3) If God is temporal, God is necessarily temporal.
- 4) Time would therefore exist necessarily.
- 5) We have a contradiction; thus, God must be atemporal.

We can see the difficulty more clearly (Craig coasts over it) if we present the argument as follows:

- 1) God exists necessarily.
- 2) Time is contingent (i.e. in some possible world time does not exist).
- 3) If necessarily something is temporal, then necessarily time exists.
- 4) If a is a necessary being, then a 's properties are necessarily instantiated.
- 5) Assume what is to be negated: God is temporal.
- 6) Temporality is necessarily instantiated (i.e. in every possible world, something is temporal) – from 1, 4 & 5.
- 7) Necessarily time exists – from 3 & 6.
- 8) Contradiction from 2 & 7.
- 9) It is not the case that God is temporal – 5 (discharged) & 8 (thus rests on 1,2,3,4).

Our premises need defending. We seem to be taking the first and second as by hypothesis, so we'll leave these for now. The third seems solid: if something temporal exists in all possible worlds, then time exists in all possible worlds (it might be possible to have time without temporal existents⁶²⁹, but temporal existents without time seems contradictory).

The key premise is the fourth. There is a superficial appearance of it just being a question of scope (the scope of 'necessarily'), but this is illusory. This is because it seems that 'necessarily *a*'s properties are instantiated' denies that *a* could have had different properties, whereas '*a*'s properties are necessarily instantiated' seems to suggest that *a* might have had different properties, but whichever properties it has partake of *a*'s necessary existence. However, brief reflection allows us to see that both in fact say that *a* will have the same properties in all possible worlds (perhaps the illusion is grounded in the historically richer meaning of 'necessary existence' as akin to a degree of existence, i.e. of the sort that a property might partake of).

Craig realises that a defence is needed of God being temporal in all possible worlds if God is temporal at all, and finds in Leftow only the argument that transworld identity will not be plausible if a God is temporal in one possible world and atemporal in another because 'temporal and timeless beings will have to have properties so radically different'⁶³⁰. One might well ask why I have opted for a more general (and thus even less defensible?) formulation. I think it allows one to see clearly another possible defence of the premise, and in such a way that one might as well go the whole hog.

Why, then, should a necessary being have the same properties in all possible worlds? Because we are drawing the concept of necessary existence from the idea of divine perfection (if God exists, God exists in all possible worlds; this is more perfect); and since various antiquated luminaries have argued that a perfect being cannot change in that it would either mean becoming less perfect (problematic) or more perfect (in which case it wasn't perfect in the first place and so not God), why can we not adapt this argument to the possible world context? In this context, it would say that whichever properties a perfect being has, it has in all possible worlds. If it had a different/opposing property, it would be either less than perfect (problematic; it would no longer be the perfect being) or more perfect (in which case, the first being considered

⁶²⁹ Depending upon whether one is willing to countenance a substantialist view of time.

⁶³⁰ Leftow, *Time and Eternity*, p.44

was not the perfect being). Since the perfect being exists in all possible worlds, transworld identity will not hold up if different worlds' perfect beings have different properties – not because of some vague difficulty leading to implausibility, but because at least one being in question is not perfect after all, and therefore not identifiable as 'perfect being/God'.

If the above defence holds up at all, then it succeeds in patching the argument up thus far. It is a pity, then, that Craig moves on to challenge the second premise – or, rather, that he claims that an argument which has as its conclusion 'necessarily time exists' (as entailed by God's necessary existence and temporality) is not problematic

What Craig misses is that 'God is temporal' is assumed for the purposes of obtaining contradiction; converting the argument to show that time is necessary would involve 'God is temporal' as a premise which must be justified independently – in short, the ball would be placed squarely in Craig's court here. Considering the inversion of this – that 'time is contingent' is a premise which must be argued for – does not necessarily produce the same effect upon the original argument: let us see how this might play out. An intuitive (for some) starting point may be that we have a better *prima facie* case for accepting 'in some possible world God exists and time does not' or at least 'time is contingent'. Some reasons might be (i) There seems to be no logical difficulty in considering a possible world without time – certainly it is easier to imagine than a non-spatial possible world. (ii) We would like to see God as 'Lord of time' such that time at least is contingent upon God's existence (iii) We would like to build on (ii) with the idea that God at least could be timeless if He wanted to be, making time thereby contingent.

Perhaps the difficulty with (ii) & (iii) is that they highlight the problems faced in mixing 'necessary being' theology with other 'possible world' philosophy. The pertinent question is 'To what extent is God's choosing His own nature an exercise in choosing to actualise a possible world, and to what extent does it represent a situation prior to a possible world context?' The theological tension, then, is between God's necessary being and God's freedom. For example, say God can choose whether He is omniscient. If so, then the argument that whichever properties a necessary being has it has in all possible worlds seems to entail that if God is omniscient then God is omniscient in all possible worlds. This 'if' is an epistemic 'if': if it *transpires* that God is omniscient, then necessarily He is so. But this implies that God cannot choose not to be omniscient; God never had access to a possible world in which he was not omniscient, and so could never actualise it.

One potential response, in line with our previous defence of premise (4) above, would be that God could still give up a property, since giving it up is a different case to not having it in the first place, and does not represent a violation of the transworld identity of perfect beings. There would not be a possible world in which ‘God is omniscient’ was false; rather ‘God is omniscient’ would be true, as would ‘God restricts/gives up His omniscience’. However, on the argument that all that is required for time is a succession of two (logically incompatible) mental states in the mind of God, this situation regarding omniscience would possibly mean that God was temporal, and *mutatis mutandis* necessarily so; we could not without further defensive work posit a timeless God who gives up/restricts His omniscience. Again, without further defensive work characterising timelessness and omniscience, this also raises the difficulty that God appears to have been able to choose to be temporal by choosing to actualise a possible world in which He gives up another divine property; how then is God necessarily timeless (or necessarily temporal) in all possible worlds as required by the defence of (4) above?

This leads one to think that – at least in the case of omniscience – perhaps God cannot choose to give up a divine property after all; certainly this would seem to follow from the basis of divine perfection. I argue that it would need to be assessed on a property-by-property basis: it is less clear that restricting omnipotence would lead to temporality, for example, and equally it is less clear that restricting omnipotence would alter divine perfection; it might be commensurable with divine omnibenevolence to restrict omnipotence for certain circumstances (which may only arise in some possible worlds), thereby maintaining divine perfection. Note also, that the plausibility of God’s being able to choose to give up a divine property as outlined depends upon the premise that God is capable of actualising any possible world. In this respect, it overlaps with the idea of creation as the actualising of possible worlds – however, a defence is not, to my mind, required in order to make sense of time’s contingency being reliant on God.

The conclusion of the core line of reasoning is that if God is timeless, He could not have chosen to be temporal, and if temporal could not have chosen to be timeless. This removes point (iii), but not (ii): God could still be responsible for a universe being temporal or atemporal through God’s being responsible for creating time in one possible world and not creating time in another possible world (creational content not being a *property of God*, and therefore open to variance across possible worlds), but *if* God is timeless, there is not a possible world in which He chooses rather to be temporal, and vice versa.

This leaves us with the result that, if God is temporal then time necessarily exists, whereas if God is atemporal then time is contingent. There are two points of interest arising. First, if we have a strong intuition that time is contingent, then we are encouraged to support a view of divine atemporality if we subscribe also to the necessary being arguments which formed our premises originally. Second, in supporting the use of 'time is contingent' as a premise in the original argument, we must be careful not to beg the question, because we are looking for the conclusion that God is not temporal. Thus, we must press on in our discussion of the contingency of time.

One option is to use our findings thus far to turn the tables on Craig's position. If God is temporal, then He is necessarily so, so Craig's idea of a God who is atemporal *sans* creation but temporal with creation⁶³¹ (i.e. that there might be a world where God never created, in which he would be atemporal) is threatened, since we are saying that if God is temporal in any possible world then God is temporal in all possible worlds. But Craig's point is that there is a possible world in which God is atemporal and time does not exist; thus, time is contingent. If he chooses to defend this, then he defends the *prima facie* acceptability of the premise that time is contingent, and incidentally makes it more difficult to defend 'God is temporal' as a premise which is not simply assumed for the purposes of deriving a contradiction. The result is that there is more pressure on Craig to defend the temporality of God as an acceptable premise to show that time is necessary. There is also more pressure to reject his overall position: that God could be atemporal *sans* creation, and that our original argument should be replaced with the argument that time is necessary, time's contingency having been discounted as a good premise.

In short, then, we have an argument that goes from God as perfect (necessary) being and the contingency of time to the conclusion that God is atemporal, the key move being that a perfect being's properties are its properties in all possible worlds. A corollary of the argument is that if God is temporal then time cannot be contingent, for only an atemporal God results in time's contingency. This leads to a second argument, that if God is temporal then there is no possible world in which time does not exist; consequently, the (Craigian/Ockhamist) position that God is atemporal *sans* creation does not work. God is either temporal or atemporal: in each case there is either creation or not, but God's temporality does not change. Rejection of this constitutes support for

⁶³¹ See for example his concise account in 'Timelessness and Omnitemporality', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, pp.129-160

the contingency of time; thus one cannot reject both this argument and the contingency premise of the first argument.

In conclusion, this argument provides a philosophical foundation for a defence of divine timelessness which is independent of the main philosophical issues with which this thesis has been concerned, but which is dependent on being able to defend a perfect being theology (or other basis of arguing God's necessary existence) and to some extent the contingency of time. The former, in particular, can be considered to form a good basis for a potential logical constraint on divine eternity favouring divine timelessness.

I shall turn now to consider the issue of 'the divine perfect life', which we recall has some historical roots in Boethius definition of eternity ('the complete possession all at once of illimitable life'⁶³²), and the argument that has been put forward for divine timelessness based upon it.

The argument essentially moves from the concept of a divine perfect life to the conclusion that such a life must be timeless. The 'sharp end' of this argument is put by Leftow in the following way: 'the past itself is *lost*, and no memory, however complete, can take its place – for confirmation ask a widower if his grief would be abated were his memory of his wife enhanced in vividness and detail.'⁶³³ The atemporal being loses nothing, possessing all of its life perfectly and timelessly.

To add some detail, it is worth beginning by noting that Leftow carefully distinguishes two motivations for this argument. He refers to a suggestion by Hasker that arguments in favour of God's timeless experience of the world over against temporal experience will draw on a metaphysical predisposition to changelessness over against change.⁶³⁴ Leftow argues that, although he believes such a preference can be supported, the argument in question relies not on this preference to motivate it, but on the 'very concrete and very intuitive claim, that it is better to be with those one loves than to remember them.'⁶³⁵

Craig observes that one strength of the argument is that it relies upon the experience of, rather than a reality-objective account of, temporal becoming. This means that adoption of a tenseless theory of time in which all moments are ontologically equal does not get a temporal God off the experiential hook; events will still be lost or inaccessible dependent upon the moment being experienced by such a temporal deity. As Paul Helm puts it, 'the idea that God is subject to the vicissitudes of

⁶³² De Consolatione v, prosa 6.

⁶³³ Leftow, *Time and Eternity*, p.278

⁶³⁴ Leftow, *Time and Eternity*, p.279; Hasker, *God, Time and Knowledge* (Ithaca: Cornell University Press, 1989), p.179-183

⁶³⁵ Leftow, *Time and Eternity*, p.279

temporal passage, with more and more of his life irretrievably over and done with, is incompatible with divine sovereignty, with divine perfection and with that fullness of being which is essential to God'.⁶³⁶

Leftow also notes that invoking God's omnipotence by arguing that God has the option for replication of any events or persons lost to memory (an option canvassed by Cook and Swinburne⁶³⁷) will not work to circumvent the issue, since it makes God either self-delusional or crass in his relation with his creatures.⁶³⁸

Craig considers another possible response to the argument for those wishing to reject divine timelessness: the expansion of God's specious present (i.e. the time interval experienced as 'now') to take in the whole of time. The benefit of this would be to allow the specification of God as temporal, whilst retaining the strength of 'whole and perfect possession of infinite life all at once' by making what is experienced as present for the temporal deity identical with all events across time. However, as Craig points out, the price is too high. A temporal God with an infinite specious present would be entirely unable to react to anything, since time would have ended precisely at the point at which the 'next' specious-present moment would begin. Quite apart from concerns over whether we want to admit of God having temporal parts (which position Craig suggests is implied by this view) or of how God's specious present could be so extended (since the usual explanations for a specious present require physical cognitive elements, such as finite velocity of neural signals), the main consequences for God's perception of and interaction with the world seem sufficient to lead us to reject this 'infinite specious present' argument.

Craig considers another way out of this situation for the temporalist, employing our concept of the specious present as a more general analogy of God's experience of time: 'God just has at every point of time a specious present which takes in the whole of time'.⁶³⁹ The thought here is that God's specious present is not one of a sequence of different specious presents, or a single specious present restricting God's experience of the world. Rather, at every moment of time God has a specious present, but this is the same specious present since it encompasses all of time. However, Craig objects to this idea on the grounds that, although God undergoes tense changes and temporal becoming

⁶³⁶ Helm, 'Divine Timeless Eternity', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.30-31

⁶³⁷ Robert Cook, 'God, Time, and Freedom', *Religious Studies* 23 (1987), p.86; Richard Swinburne, *The Coherence of Theism* (New York: Oxford University Press, 1977), p.220

⁶³⁸ Leftow, *Time and Eternity*, p.279 – This has no small relevance to the debate concerning bodily resurrection, since if the resurrected person is technically to be regarded as a replica rather than the real person, Leftow's remark effectively destroys any position which entails this interpretation to be the case.

⁶³⁹ Craig, *God, Time & Eternity*, p.36

(on a tensed theory of time), God nevertheless cannot, seemingly, know enough to act in a timely fashion, since – having the same all-encompassing specious present at each moment – God cannot apparently distinguish one moment from another and thus cannot know which temporal location He currently inhabits.

If we embrace a tenseless theory of time, says Craig, matters are just as bad, since the temporal God has no moment-relative now-awareness to distinguish one location in the time series from another, and so again cannot act in a timely fashion. In short, it seems that this response to the argument solves the problem for a temporal God who only wishes to know the contents of His creation, but not for a God who wishes to interact with it. This puts a big hole in the temporalist position, since one assumes that a key motivation in adopting divine temporalism is securing a foundation for God's interaction with the world.

Consider Wolterstorff's criticism of the 'divine fullness' argument: he suggests that it is timelessness that is the impoverished existence compared to temporality, rather than vice versa. 'Change, and the changing experiences of change, makes possible a fullness in the totality of one's life experiences that would be impossible without change.'⁶⁴⁰

However, the examples Wolterstorff employs are examples which would be problematic on a number of levels, and not necessarily problematic for the idea of divine timelessness. He talks about watching children grow up and seeing Hagia Sophia from different angles as things that a timeless God could not do. However, a timeless God might be able to do them, dependent upon how we construe God's omnipresence as a mode of experience. And it is unclear how a timeless God has more of difficulty than a temporal God here in certain key respects; if a temporal God is not omnipresent, then what might God's experience of seeing Hagia Sophia from different angles consist in? Does God need to be spatial and/or physical to appreciate fully either Hagia Sophia or children growing up? Similarly, the example Wolterstorff gives of building a piece of furniture raises questions of God's physicality and omnipotence; why should God's temporality be the key issue here?

The only example with any bite seems to be the experience of listening to a piece of music. However, this equally raises questions of physicality (how can a non-physical God experience sound?) and suggests that, if we can give an answer as to God's experience of music (such as direct non-physical experience) then we could

⁶⁴⁰ Wolterstorff, 'Unqualified Divine Temporality', in Gregory E. Ganssle (ed.), *God and Time: Four Views*, p.73

equally give an answer to timeless experience of music, such as through non-temporal sequence, which does not demand a leap of imagination of a different order to that required by God's non-physicality when it comes to music appreciation.

Craig's own response to the key 'argument from divine perfect life' is in some ways frustrating, for reasons that will become readily apparent. He makes the following points:

When we recall that God is perfectly omniscient and so forgets absolutely nothing of the past and knows everything about the future, then time's tooth is considerably dulled for Him... A fatal flaw in Leftow's analysis is his assumption that God, like the widower, has actually lost the person He loves and remembers. But according to Christian theism, this assumption is false. Those who perish physically live on in the afterlife where they continue to be real and present to God... So it is far from obvious that the experience of temporal passage is so melancholy an affair for an omniscient God as it is for us.⁶⁴¹

There are three things that can be said of this response. First, we can still extend Leftow's argument that the widower would not be entirely reassured by the prospect of perfect memory clarity regarding his wife, and that a parent can still mourn the 'loss' of a stage in a child's life⁶⁴², to make the point that the temporal God still loses something that cannot be regained.

Second, invoking a concept of the afterlife seems to raise more questions than it answers; we have already seen that we must be careful about using God's omnipotence to get around the problem of loss, and we would need a very well-developed theology and philosophy of post-mortem survival to secure the kind of proofing against loss that Craig's response might require.

Finally, Craig needs to be careful not to drag his position accidentally into the path of a kind of criticism normally levelled at divine timelessness. The critic of divine timelessness occasionally argues that one consequence of that position is God's timeless and unvarying possession of experiences of all the suffering of his creatures – i.e. that even in the joy of the eschaton, the suffering is not transformed or eliminated because it exists tenselessly. The divine temporalist asserts that a strength of their position is that the suffering experienced by God is transformed into joy; that it passes much as our experience of it passes. In short, divine temporality is 'less cruel to God'. However, Craig's argument here runs a risk of eliminating this advantage; to the extent that time's tooth is dulled, one might say, time's healing effect is also dulled. The parent loses the

⁶⁴¹ Craig, *God, Time & Eternity*, p.38-39

⁶⁴² Leftow, *Time and Eternity*, p.278

joy of the child growing up, but retains a perfect memory of those moments; the parent is no longer in the midst of the child's suffering of a desperate illness, but has a perfect memory of what it was to go through it. We shall return to this potential 'cannot have one's cake and eat it' very shortly.

Let us look at the aforementioned criticism of divine timelessness more carefully. The argument goes as follows: a timeless God experiences all the suffering and joy of history tenselessly outside time; the crucifixion is an eternal event in the experience of God, say, and so is the eschaton. What, then, are we attributing to God? It seems that the suffering of the crucifixion is de-fanged, because it is tinged with the knowledge of the joy of eschatological salvation, whilst the joy of the eschaton is diminished because it is tinged with the suffering of the crucifixion. The result is two-fold: first, how can God really be 'the fellow sufferer who understands' when he has constant 'privileged access' which we do not have – namely, He knows of the eschaton, whereas we 'here in the middle' suffer the more acutely for not knowing the joy of the end as certain. Second, God is deprived of being truly joyful with us at the eschaton, because the suffering of the crucifixion never passes away. The former, then, attacks our *relationship* with God, whilst the latter is an attack by way of what our theology effectively *inflicts upon* God.

The temporal God, by contrast in this argument, suffers through the crucifixion and can empathise fully with our suffering, but, as for us, this suffering passes away to be transformed into joy at the eschaton – a joy that we share fully with God, in presumably sharing the experience of the passing away of sin and suffering, and their replacement with joy and blessedness.

This argument is the flip side of the 'divine fullness' argument. We are now in a position to compare the two and draw a more specific tension out of them. The most obvious conclusion to draw is that employing 'the divine perfect life' as a philosophical foundation for a defence of divine timelessness is a dangerous path to take. One reason might be that it is difficult to provide a rigorous philosophical account of what 'the divine perfect life' might mean. But we shall set this aside, since it is clear that the primary reason, to put it bluntly, is that theologians have rather different ideas about what it would be for God to have a perfect life. The perfect divine life for the atemporalist is a terrible prospect for the temporalist, and *vice versa*.

I would contend that taken together these atemporalist/temporalist options represent the essential tension between the demand for a transcendent God (understood as a demand for 'otherness' from the world) and the demand for an immanent or more

human God (understood as ‘likeness’ or involvement with the world); the atemporalists are arguing the line that ‘if God is like us, then God can’t be God’, whilst the temporalists are arguing ‘if God isn’t like us, God can’t be God’. The atemporalist is reacting against a concept of a God who must await the time to act, who might be restricted in propositional omniscience and universal omnipotence, who suffers the loss of moments or persons which cannot be regained, who is more like a creature than a creator. The temporalist is reacting against a concept of a God who cannot truly empathise with the human condition, who seems alien in mode of being and experience, and on whom is inflicted, in virtue of being related as Creator to His Creation, an at once impoverished, static and supremely turbulent mental life. To adapt Oscar Wilde to the theological point in hand: the theological rejection of the immanent is the rage of Caliban seeing his own face in a glass; the theological rejection of the transcendent is the rage of Caliban not seeing his own face in a glass.⁶⁴³ Can we do anything with this to salvage a philosophical foundation of use to the defender of divine timelessness?

I would suggest that the only real option here is to put in a bid for transcendence as being (i) desirable and (ii) not as bad as one would think if one were a temporalist. To begin with, it is surely worth observing that the language of otherness and transcendence is very hard to pin down logically. Nevertheless, a few points are worth exploring. We might consider the distinction between contrastive and non-contrastive transcendence suggested by Kathryn Tanner⁶⁴⁴. In the former, God’s otherness is categorised by starting with the world. As Steven Crain puts it:

If we are to assert God’s transcendence by way of contrast, we take every property of the world and deny it of God, so that, once the contrast is complete, God is seen to exist in no sense within the world.⁶⁴⁵

This, Tanner and Crain suggest, results in a God who is ‘not in the world by virtue of being parallel to the world.’⁶⁴⁶ The alternative model of transcendence is ‘non-contrastive’, and involves the rejection of ‘this mode of non-identity through contrast’⁶⁴⁷; in short, it denies also that God is a thing in a specific state of separation from the world. This is taken to show that the contrastive model really considers God

⁶⁴³ Cf Oscar Wilde, *The Picture of Dorian Gray*, (Oxford: Oxford University Press, Oxford World’s Classics edition 1998), p.xxiii

⁶⁴⁴ Kathryn E. Tanner, *God and Creation in Christian Theology: Tyranny or Empowerment?* (New York: Basil Blackwell, 1988), see especially Chapter 2.

⁶⁴⁵ Steven Crain, ‘God Embodied in, God Bodying Forth the World: Emergence and Christian Theology’, *Zygon* 41:3 (2006), p.669

⁶⁴⁶ Crain, ‘Emergence and Christian Theology’, p.669

⁶⁴⁷ Crain, ‘Emergence and Christian Theology’, p.669

as one more thing in the world in order to be able to make comparisons and finally show that God must be outside the world, for – as William Placher puts it – if ‘God were one of the things in the world – as implied by a contrastive model of transcendence – then it would be natural to ask where God is located – in the world or outside it?’⁶⁴⁸ This is difficult material to make sense of: presumably God is either in the world or not; if so then God is not separate from the world, if not then God is separate from the world. One cannot have both. Luckily, some elucidation of a more philosophically rigorous approach is available.

Leftow states a ‘Zero Thesis’ respect to God; might this provide a suitable philosophical characterisation for transcendence? Leftow suggests that the assertion ‘there is no distance between God and any spatial entity’⁶⁴⁹ be construed as ‘there is a distance-relation between God and any spatial entity and the distance between them is zero’⁶⁵⁰ as opposed to ‘it is not the case that there is a distance-relation between God and any spatial entity’⁶⁵¹. In brief, he defends this by arguing that to say that there *is* a distance relation is not to say that there is a *positive* distance; zero is not positive, after all. So the difference between the second and third statements above is constituted by the fact ‘that when one says that there is no distance between God and spatial things, one talks about the distance between them. One does not say there is no such relation.’⁶⁵² Thus God is not spatially located, but is in a sense spatially contiguous with any and all places.

Now, Leftow takes this as a basis for a defence of divine timelessness, and combines it with the ‘very general property of time (its being a fourth dimension of an extensive continuum)’ and a further thesis to provide the core of his theory. We have seen the problem (which is commuted to his theory of timelessness) that the general property of time is a property of physical time and that Leftow has ruled himself out of the resources required to get around the critical responses – for so I have argued already. However, Leftow himself notes that the strength of the Zero Thesis is that it resolves the issue of how God could be omnipresent even though God is supposed to be without spatial location.

This sounds like it could be a good basis for affirming the transcendence (and compatible immanence) of God. For if God is not spatially located and yet is

⁶⁴⁸ William C. Placher, *The Domestication of Transcendence: How Modern Thinking About God Went Wrong* (Westminster: John Knox Press, 1996), p.112

⁶⁴⁹ Leftow, *Time and Eternity*, p.222

⁶⁵⁰ Leftow, *Time and Eternity*, p.222

⁶⁵¹ Leftow, *Time and Eternity*, p.223

⁶⁵² Leftow, *Time and Eternity*, p.226

omnipresent, then God is not ‘in the world’ but, if God is causally responsible for the world, is in an important sense not entirely dissociated from the world.

Clearly this sort of philosophical foundation for transcendence will require some defence, much as the concept of a necessary or perfect being requires some defence if that is to be used as a philosophical foundation. Leftow provides some defensive manoeuvres himself.⁶⁵³ The basic motivation for affirming any sort of transcendence in the first place seems unproblematic (after all, we no longer find the idea of the Olympian gods attractive, and I suggest this is not just because we are polytheism-averse) – the question is one of degree. So the issue boils down to giving an account of transcendence that does not deny immanence – which I suggest we have begun to do – and showing that the relevantly transcendent timeless God is not such a distressing idea as the temporalist thinks.

How can we assure the temporalist that transcendence and timelessness are not as bad as they might think? Perhaps by arguing that the fact that a timeless God’s mode of experience takes in equally both the vile and the joyful should only worry us if we believe that mode of experience to *have to be* similar to our own in important respects. Naturally it would be upsetting for a temporal being to conceptualise the situation in temporal perspective: in imaginative analogy, we can only think of two events being spatially co-extant at the same moment, and for that moment to be unending. Clearly imagining timelessness in this way makes it difficult to see how either of the opposed experiences could retain their full meaning when contrasting with each other in such a way.

However, a timeless God has a timeless mode of experience: we should expect this to be a very different situation, but should we therefore reject it? We could illustrate this with respect to omnipresence or omniscience. One might ask the question, how can an omnipresent or omniscient being, who is immediately aware of a great joy in one place and a great tragedy in another, be able to deal with the experiential immediacy of such a combination? Would it not be like taking a telephone call in the middle of a sibling’s wedding celebration and discovering that one’s best friend had been horrifically murdered? But just as we seem to think that God can deal with such situations without our having to deny that God is omniscient or omnipresent, so presumably ought we to think that God can deal with a timeless mode of experience. Does this attack our idea of our *relationship with God*, even if it evades the problem of what timelessness *inflicts on God*? I suggest it only affects our relationship with God in

⁶⁵³ Leftow, *Time and Eternity*, pp.223-226

the way that any philosophical account of divine attributes, or any ascription of 'otherness', poses problems for how we relate to God; exploring this is, surely, one of the many tasks that theology must undertake.

In summary then, there are two lines of argument from within theological issues that potentially supply philosophical foundations for a defence of divine timelessness. The first runs from the concept of God as a necessary being to the concept of divine timelessness (with options on arguing from time's contingency), and may constitute a logical constraint in favour of divine timelessness from inside of theology – pending a coherent outworking of perfect/necessary being, and so forth.

The second involves a move from the nature of the divine life to the ascription of a timeless mode of existence to that life. We have seen that, as an argument that might form a constraint on divine eternity in favour of timelessness or against temporality, this is likely to be a two-edged sword. However, a philosophical characterisation of divine transcendence and immanence can provide an account which potentially copes with the side of the argument that cuts against divine timelessness. So although a direct constraint is not formed, we may choose to see that characterisation as a plausible philosophical foundation for a defence of divine timelessness insofar as that defence must take account of temporalist concerns about the divine life. I suggest, therefore, that both potential philosophical foundations from 'within' the domain of theology are admissible and should take their place with the foundational material centred on the denial of an absolute and ontologically favoured present in the philosophy of time.

Conclusion

From the starting point of needing to say something about ‘time’ if we are to say something about ‘God and time’, I have attempted to develop some philosophical foundations for a defence of divine timelessness. Methodologically, these foundations may be considered equally appropriate for any discussion of God and time – temporalist or atemporalist – and have concentrated on developing a systematic structure to facilitate the interactions of science, philosophy and theology through describing constraints, boundaries, and conditions for involvement, particularly concentrating on the plausibility of logical constraints introduced on divine eternity from ‘outside’ of traditional theology and philosophy of religion.

On the other hand, I have attempted to isolate and examine the key issue of the ontological/metaphysical status of the present as a primary determining factor within the methodological structure. This examination has ranged over issues of science, language, facts and ontology, and epistemology. Finally, I have considered philosophical foundations that might be found from a consideration of ‘God’ rather than of ‘time’ *per se*; these I characterised as fitting into the overall methodological structure as potential constraints on divine eternity derived from ‘within’ theology – the nature of God – rather than ‘outside’ of it, as with logical constraints arising from the study of time.

What has all of this achieved, and what does it provide a groundwork for? There are two topics of discussion here: first, the topic of divine eternity itself and, second, wider applications in the field of philosophy of religion. The ramifications for divine eternity are by now, I hope, clear enough. Even the defender (or critic) of divine timelessness who wishes to concentrate their efforts on arguments concerning perfect being theology, say, must be aware that they will probably require, sooner or later, some philosophical commitments in the area of the philosophy of time, and that these cannot really be avoided. Having certain views about time and rather contrasting views about eternity is liable to create intellectual problems that demand hard work to resolve.

Even once the defender of divine timelessness has incorporated relevant positions on the status of the present and the constraints that are formed, the task is far from over. There are many arguments which may need to be addressed, ranging from the usefulness of McTaggart’s paradox in defeating A-theories of time, through extended treatments of the epistemology of ‘temporal becoming’ and change, through to the question of how things persist through time. The defender of divine timelessness,

by taking certain positions as foundational (and especially in developing constructive B-theoretical arguments), must be ready to engage with critical resources and responses from these topics as and when they arise: this is no small commitment. The thorniest problem likely to be faced is the demand for an account of causation, a problem which is made more vital by way of its forming a traditional topic of debate in the philosophy of religion. The defender of divine timelessness (and no less the defender of divine temporality) will eventually need an account both of how causation works in concert with the positions adopted in the philosophy of time, and of how God is causally efficacious as Creator.

In terms of wider applications for issues in the philosophy of religion, we might distinguish issues which might benefit from the methodological analysis as well as the topic-specific content of this thesis, from issues which are affected by the view that one holds on divine eternity its foundations. In the latter camp, the most interesting consequences (in my view) are for the topics of petitionary prayer and divine dialogue, since in both of these the exponent of divine timelessness must address the ‘illusion of temporal interaction’, and for the topic of free will and the reality of the future, since embracing an ‘ontological equality’ thesis about time together with certain versions of divine timelessness will raise questions about determinism.

The obvious connection to be made, both in the above terms and from the methodological viewpoint, is with the topic of omniscience. Many of the same positions and lines of argument that have been relevant in this thesis can be commuted to the debate about God’s knowledge, although in methodological structure the constraints formed concerning temporality are prior to the issue of God’s knowledge of a temporal reality, and the question of whether that knowledge is in temporal or atemporal mode.

Methodologically speaking, the main issue (to which I have on occasion alluded) which I judge could benefit from the structural analysis of this thesis is the debate over post-mortem survival, and in particular the coherence of belief in bodily resurrection. It seems to me that the same nexus of science, philosophy and theology is present in that debate: neuroscience, the philosophy of diachronic personal identity and the theology of bodily resurrection form a comparable structure whereby to answer the question ‘what must be true of me if I am to survive my death?’ we must identify a similar system of constraints.

Although there are undoubtedly more, the various issues I have presented above are those I take to be most immediate or interesting in their connections with this thesis,

and to demonstrate its wider import for the philosophy of religion. I would nevertheless hope that its intended contribution to the debate over divine eternity is the most notable: to persuade theologians and philosophers of religion of the desirability of a rigorous methodological structure integrating science, philosophy and theology, and of the plausibility of philosophical foundations for a defence of divine timelessness.

Bibliography

- Adams, Steve, *Relativity: An Introduction to Space-Time Physics* (London: Taylor and Francis Ltd., 1997)
- Aertsen, Jan A., ‘Aquinas’s Philosophy in its Historical Setting’, in Norman Kretzmann, and Eleonore Stump (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.12-37
- Alston, William, ‘Does God Have Beliefs?’ in *Divine Nature and Human Language: Essays in Philosophical Theology* (Ithaca, NY: Cornell University Press, 1989)
- Anderson, R., Vetharaniam, I., and Stedman, G. E., ‘Conventionality of Synchronization, Gauge Dependence, and Test Theories of Relativity’ *Physics Reports* 295 (1998), p.93-180
- Aquinas, *Commentary on Aristotle’s Physics*, trans. R. J. Blackwell, R. J. Spath and W. E. Thirlkel (London: Routledge & Kegan Paul, 1963)
- Aquinas, *Summa Theologiae*, trans. T. McDermott (London: Eyre & Spottiswoode, 1964)
- Aristotle, *Metaphysics*, trans. J. Warrington (London: Dent, 1956)
- Armstrong, David, *A World of States of Affairs*, (Cambridge: Cambridge University Press, 1997)
- *What is a Law of Nature?* (Cambridge: Cambridge University Press, 1983)
- Augustine, *Confessions*, trans. H. Chadwick (Oxford: Oxford University Press, 1998)
- Balashov, Yuri, and Janssen, Michael, ‘Presentism and Relativity’, *British Journal for the Philosophy of Science* 54 (2003), p.327-346

- Barnes, Jonathan, 'Metaphysics' in Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.66-108
- Bigelow, John, 'Presentism and Properties', in James E. Tomberlin (ed.), *Philosophical Perspectives, Volume X: Metaphysics* (Cambridge: Blackwell, 1996), p.35-52
- Boethius, *The Consolation of Philosophy*, trans. V. Watts (London: Penguin, revised edition 1999)
- Bohm, David, *The Special Theory of Relativity* (London: Routledge, 1996)
- Bourne, Craig, *A Future for Presentism* (Oxford: Oxford University Press, 2006)
- Brecher, Kenneth, 'Is the speed of light independent of the velocity of the source?', *Physics Review Letters* 39:17 (1977), p.1051-1054
- Brush, Stephen G., 'The Reception of Mendeleev's Periodic Law in America and Britain', *Isis* 87:4 (1996), p.595-628
- Burrell, David B., 'Aquinas and Islamic and Jewish Thinkers', in Kretzmann, Norman, and Stump, Eleonore (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.60-84
- Butterfield, Herbert, *The Origins of Modern Science* (New York: Free Press, 1997)
- Butterfield, Jeremy, 'Seeing the Present', in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.13-42
- Callender, Craig, 'Review of Mauro Dorato *Time and Reality: Spacetime Physics and the Objectivity of Temporal Becoming*', *The British Journal for the Philosophy of Science* 48:1 (1997), p.117-120
- (ed.), *Time, Reality and Experience* (Cambridge: Cambridge University Press, 2002)

- 'The Subjectivity of the Present' http://philosophy2.ucsd.edu/~callende/index_files/Subjectivity%20of%20the%20Present17.doc (last accessed 30/09/07)

- Chisholm, Roderick M., and Dean W. Zimmerman, 'Theology and Tense', *Noûs* 31:2 (1997), p.262-265

- Cook, Robert, 'God, Time, and Freedom', *Religious Studies* 23 (1987), p.81-94

- Conant, James Bryan (ed.), *The Overthrow of Phlogiston Theory: The Chemical Revolution of 1775–1789* (Cambridge: Harvard University Press, 1950)

- Craig, William Lane, 'God and Real Time', *Religious Studies* 26 (1990), p.335-347

- 'The Special Theory of Relativity and Theories of Divine Eternity', *Faith and Philosophy* 11 (1994), p.19-37

- 'The Tensed vs. Tenseless Theory of Time: A Watershed for the Conception of Divine Eternity', in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.221-250

- 'On the Alleged Metaphysical Superiority of Timelessness', *Sophia* 37 (1998), p.1-9

- 'The Eternal Present and Stump-Kretzmann Eternity', *American Catholic Philosophical Quarterly* 73 (1999), p.521-536

- *The Tensed Theory of Time: A Critical Examination* (Dordrecht: Kluwer Academic Publishers, 2000)

- *The Tenseless Theory of Time: A Critical Examination* (Dordrecht: Kluwer Academic Publishers, 2000)

- 'Omniscience, Tensed Facts, and Divine Eternity', *Faith and Philosophy* 17 (2000), p.225-241

- *God, Time, and Eternity* (Dordrecht: Kluwer Academic Publishers, 2001)

- *Time and the Metaphysics of Relativity* (Dordrecht: Kluwer Academic Publishers, 2001)
- ‘Timelessness & Omnitemporality’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.129-160
- ‘Response to Paul Helm’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.63-68
- ‘Response to Alan G. Padgett’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.115-119
- ‘Response to Nicholas Wolterstorff’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.222-224
- ‘Response to Critics’, in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.175-186
- ‘The Elimination of Absolute Time by the Special Theory of Relativity’, in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.129-152
- Craig, William Lane, and Smith, Quentin, *Theism, Atheism, and Big Bang Cosmology* (Oxford: Clarendon Press, 1993)
- Craig, William Lane, and Smith, Quentin (eds.), *Einstein, Relativity and Absolute Simultaneity* (London: Routledge, 2007)
- Crain, Steven D., ‘God Embodied in, God Bodying Forth the World: Emergence and Christian Theology’, *Zygon* 41:3 (2006), p.665-673
- Cunningham, D. W., V. A. Billock, and B. H. Tsou, ‘Sensorimotor Adaptation to Violations of Temporal Contiguity’, *Psychological Science* 12 (2001), p.532-535

- Davies, Brian, “‘Simple’: Introduction’, in Brian Davies (ed.), *Philosophy of Religion A Guide and Anthology* (Oxford: Oxford University Press, 2000), p.533-538
- Davies, Paul, *About Time: Einstein’s Unfinished Revolution* (New York: Simon and Schuster, 1995)
- Delaney, C. F., ‘Critical Realism’ in Robert Audi (ed.), *The Cambridge Dictionary of Philosophy* (Cambridge: Cambridge University Press, 2nd ed. 1999)
- Dennett, Daniel C., and Marcel Kinsbourne, ‘Time and the Observer’, *Behavioural and Brain Sciences* 15:2 (1992), p.183-247
- DeWeese, Garrett J., *God and the Nature of Time* (Aldershot: Ashgate, 2004)
- ‘Atemporal, Sempiternal, or Omnitemporal: God’s Temporal Mode of Being’, in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.49-61
- Diekemper, Joseph, ‘Presentism and Ontological Symmetry’, *The Australasian Journal of Philosophy* 83:2 (2005), p.223-40
- Dillon, John M., ‘Neoplatonism’, in Robert Audi (ed.), *The Cambridge Dictionary of Philosophy* (Cambridge: Cambridge University Press, 2nd ed. 1999)
- Dorato, Mauro, ‘Review of William Lane Craig, *Time and the Metaphysics of Relativity*’, *Studies in History and Philosophy of Modern Physics* 34B:1 (2002), p.153-157
- Dretske, Fred I., ‘Laws of Nature’, *Philosophy of Science*, 44 (1977)
- Dyke, Heather, ‘Real Times and Possible Worlds’, in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.13-42
- Einstein, Albert, *Relativity: The Special and General Theory* (New York: Henry Holt and Company, 1920)

- ‘Autobiographical Notes’, in P. A. Schlipp (ed.), *Albert Einstein: Philosopher-Scientist*, (Evanston, IL: Library of Living Philosophers, 1949), p.1-95
- Esfeld, Michael, ‘Metaphysics of Science Between Metaphysics and Science’, *Grazer Philosophische Studien* special issue: Alex Burri and Christian Beyer (eds.), *Philosophical Knowledge – Its Possibility and Scope*, January 2007
- Everson, Stephen, ‘Psychology’, in Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.168-194
- Ferraro, Rafael, and Sforza, Daniel M., ‘Arago (1810): the first experimental result against the ether’, *European Journal of Physics* 26 (2005), p.195-204
- Fernie, J. D., ‘The Historical Search for Stellar Parallax’, *Journal for the Royal Astronomical Society of Canada* 69 (1975), p.222-239
- Fitzgerald, Paul, ‘Stump and Kretzmann on Time and Eternity’, *The Journal of Philosophy*, 82:5 (1985), p.260-269
- Ganssle, Gregory E., ‘Atemporality and the Mode of Divine Knowledge’, *International Journal for the Philosophy of Religion* 34 (1993), p.171-80
- (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001)
- ‘Direct Awareness and God’s Experience of a Temporal Now’, in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.165-181
- Ganssle, Gregory E. & Woodruff, David M., (ed.), *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002)
- Geach, Peter, ‘What must be true of me if I survive my death?’ in Brian Davies (ed.) *Philosophy of Religion A Guide and Anthology* (Oxford: Oxford University Press, 2000) p.724-725

Gilson, E., *Pourquoi Saint Thomas a critiqué Saint Augustin* (Paris: J. Vrin, 1986)

Grünbaum, Adolf, 'The Falsifiability of the Lorentz-Fitzgerald Contraction Hypothesis', *The British Journal for the Philosophy of Science* 10:37 (1959), p.48-50

— 'The Pseudo-Problem of Creation in Physical Cosmology', *Philosophy of Science* 56 (1989), p.373-394

— 'The Special Theory of Relativity as a Case Study of the Importance of the Philosophy of Science for the History of Science', in B. Baumrin (ed.), *Philosophy of Science* [The Delaware Seminar, vol. 2] (New York: Interscience Publishers, 1962-1963), p. 171-204

— 'David Malament and the Conventionality of Simultaneity: A Reply', in Adolf Grünbaum (ed.) *Philosophy of Science in Action* (New York: Oxford University Press, Forthcoming)

— 'Why I am Afraid of Absolute Space', *Australasian Journal of Philosophy* 49:1 (1971), p.96

Haggard, Patrick, Sam Clark, and Jerry Kalogeras, 'Voluntary Action and Conscious Awareness', *Nature Neuroscience* 5 (2002), p.382-385

Hales, Steven D., and Johnson, Timothy A., 'Endurantism, Perdurantism and Special Relativity' in *Philosophical Quarterly* 53:213 (2003), p. 527-539

Hankinson, R. J., 'Philosophy of Science', in Jonathan Barnes (ed.) *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.109-139

Hasker, William, *God, Time and Knowledge* (Ithaca, N.Y.: Cornell University Press, 1989)

— ‘The Absence of a Timeless God’, in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.182-206

Hawley, Katherine, ‘Science as a Guide to Metaphysics’, *Synthese* 149 (2006), p.451-470

Helm, Paul, ‘God and Spacelessness’, *Philosophy*, 55:212 (1980), p.211-221

— *Eternal God* (Oxford: Oxford University Press, 1988)

— ‘Divine Timeless Eternity’ in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.28-60

— ‘Response to Alan G. Padgett’ in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.111-114

— ‘Response to William Lane Craig’ in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.161-164

— ‘Response to Nicholas Wolterstorff’ in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.214-218

— ‘Response to Critics’ in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.79-91

— ‘The Problem of Dialogue’, in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.207-221

— ‘Time and Time Again: Two Volumes by William Lane Craig’, *Religious Studies* 38 (2002), pp.489-498

Hogarth, Mark ‘Conventionality of Simultaneity: Malament’s Result Revisited’, *Foundations of Physics Letters* 18:5 (2005), p.491-497

- Janssen, Michael, *A Comparison Between Lorentz's Ether Theory and Special Relativity in the Light of the Experiments of Trouton and Noble*, Ph.D. Thesis (University of Pittsburgh, 1995)
- 'Reconsidering a Scientific Revolution: The Case of Einstein *versus* Lorentz', *Physics in Perspective* 4 (2002), p.421-446
- Jordan, Mark D., 'Theology and Philosophy', in Kretzmann, Norman, and Stump, Eleonore (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.232-251
- Kosso, Peter, *Appearance and Reality: An Introduction to the Philosophy of Physics* (Oxford: Oxford University Press, 1998)
- Land, Kate and Magueijo, João, 'The Axis of Evil Revisited', *Monthly Notices of the Royal Astronomical Society* 378 (2007), p.153-158
- Leaman, O., *Averroes and His Philosophy* (Oxford: Clarendon Press, 1988)
- Leftow, Brian, *Time and Eternity* (Ithaca: Cornell University Press, 1991)
- 'The Eternal Present', in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.21-48
- Le Poidevin, Robin, *Change, Cause and Contradiction* (New York: St. Martin's Press, 1991)
- 'Relationism and Temporal Topography: Physics or Metaphysics?', in Robin Le Poidevin and Murray MacBeath (eds.), *The Philosophy of Time* (Oxford: Oxford University Press, 1993), p.149-167
- 'The Past, Present, and Future of the Debate About Tense', in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.13-42

— *Travels in Four Dimensions* (Oxford: Oxford University Press, 2003)

Lodge, Oliver, 'Aberration Problems: A Discussion concerning the Motion of the Ether near the Earth, and concerning the Connexion between Ether and Gross Matter; with Some New Experiments', *Philosophical Transactions of the Royal Society of London A*, 184 (1893), p. 727-804

Lowe, E. J., 'Tense and Persistence', in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.43-60

— *The Possibility of Metaphysics* (Oxford: Clarendon Press, 1998)

— *A Survey of Metaphysics* (Oxford: Oxford University Press, 2002)

MacBeath, Murray, 'Omniscience and Eternity I', *Aristotelian Society Supplementary Volume 63* (1989): 55-73

Malament, David, 'Causal Theories of Time and the Conventionality of Simultaneity', *Noûs* 11 (1977), p.293-300

McCall, Storrs, and Lowe, E. J., '3D/4D Equivalence, the Twins Paradox, and Absolute Time', *Analysis* 63:278 (2003), pp.114-123

McGinn, Colin, 'Existence', in *Logical Properties* (Oxford: Oxford University Press, 2000), p.15-51

McTaggart, J. M. E., 'The Unreality of Time', in Robin Le Poidevin and Murray MacBeath (eds.), *The Philosophy of Time* (Oxford: Oxford University Press, 1993), p.23-34

Mellor, D. H., 'Special Relativity and Present Truth', *Analysis* 34 (1973-4), p.74-77

— *Real Time* (Cambridge: Cambridge University Press, 1981)

- ‘History without the Flow of Time’, *Neue Zeitschrift für Systematische Theologie und Religionsphilosophie* 28 (1986), p.75
- ‘The Unreality of Tense’, in Robin Le Poidevin and Murray MacBeath (eds.), *The Philosophy of Time* (Oxford: Oxford University Press, 1993), p.47-62
- *Real Time II* (London: Routledge, 1998)
- Michelson, A. A., ‘The Relative Motion of the Earth and the Luminiferous Aether’, *American Journal of Science* S. 3, 22 (1881), p.120-129
- Michelson, A. A., and Morley, E. W., ‘On the Relative Motion of the Earth and the Luminiferous Aether’, *Philosophical Magazine* S. 5, 24:151 (1887), p.449-463;
- Nerlich, Graham, ‘Time as Spacetime’, in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.119-134
- Nordenson, Harald, *Relativity, Time and Reality: A Critical Investigation of The Einstein Theory of Relativity from a Logical Point of View* (London: George Allen and Unwin Ltd, 1969)
- Newman, Andrew, *The Physical Basis of Prediction* (Cambridge: Cambridge University Press, 1992)
- Oaklander, L. Nathan, *Temporal Relations and Temporal Becoming: A Defence of a Russellian Theory of Time* (Lanham MD.: University Press of America, 1984)
- ‘Craig on McTaggart’s Paradox and the Problem of Temporary Intrinsic’, *Analysis* 59.4 (October 1999), p.314-318
- Oppy, Graham, *Ontological Arguments and Belief in God* (Cambridge: Cambridge University Press, 1996)

Owens, Joseph, 'Aristotle and Aquinas', in Kretzmann, Norman, and Stump, Eleonore (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.38-59

Padgett, Alan G., *God, Eternity, and the Nature of Time* (New York: St. Martin's Press, 1992)

— 'Eternity and the Special Theory of Relativity', *International Philosophical Quarterly* 33:2 (1993), p.219-223

— 'Eternity as Relative Timelessness', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.92-110

— 'Response to Paul Helm', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.61-62

— 'Response to William Lane Craig', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.165-169

— 'Response to Nicholas Wolterstorff', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.219-221

— 'Response to Critics', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.124-128

— 'Divine Foreknowledge and the Arrow of Time: On the Impossibility of Retrocausation', in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.65-74

Pike, Nelson, *God and Timelessness* (London: Routledge & Kegan Paul, 1970)

Placher, William C., *The Domestication of Transcendence: How Modern Thinking About God Went Wrong* (Westminster: John Knox Press, 1996)

- Plantinga, Alvin, 'The Reformed Objection to Natural Theology', in Michael Peterson et al, *Philosophy of Religion: Selected Readings* (Oxford: Oxford University Press, 1996), p.309-320
- 'On Reformed Epistemology', in Michael Peterson et al, *Philosophy of Religion: Selected Readings* (Oxford: Oxford University Press, 1996), p.330-335
- Prior, Arthur N., 'Changes in Events and Changes in Things', in Robin Le Poidevin and Murray MacBeath (eds.), *The Philosophy of Time* (Oxford: Oxford University Press, 1993), p.35-46
- Psillos, Stathis, *Scientific Realism: How Science Tracks Truth* (London: Routledge, 1999)
- Putnam, Hilary, 'Time and Physical Geometry' *Journal of Philosophy* 64 (1967), p.240-247
- Sarkar, Sahotra and Stachel, John, 'Did Malament Prove the Non-Conventionality of Simultaneity in the Special Theory of Relativity?', *Philosophy of Science* Vol. 66, No.2 (June 1999), p.208-220
- Saunders, Simon, 'How Special Relativity Contradicts Presentism', in Craig Callender (ed.), *Time, Reality and Experience* (Cambridge: Cambridge University Press, 2002), p.277-92
- Schröder, Ulrich E., *Special Relativity* (Singapore: World Scientific, 1990)
- Shoemaker, Sydney, 'Time Without Change', in Robin Le Poidevin and Murray MacBeath (eds.), *The Philosophy of Time* (Oxford: Oxford University Press, 1993), p.63-79
- Sider, Theodore, *Four-Dimensionalism: An Ontology of Persistence and Time* (Oxford: Clarendon Press, 2001)

- Sklar, Lawrence, *Philosophy and Spacetime Physics* (London: University of California Press, 1985)
- Skorupski, John, 'Irrealist Cognitivism', *Ratio* XII:4 (1999), p.436-459
- Smith, Quentin, 'The Phenomenology of A-Time', *Dialogos* 52 (1988), p.143-153
- *Language and Time* (Oxford: Oxford University Press, 1993)
- 'Absolute Simultaneity and the Infinity of Time', in Robin Le Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), p.135-184
- 'Time Was Created by a Timeless Point: An Atheist Explanation of Spacetime', in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.95-128
- Smith, Robin, 'Logic', in Jonathan Barnes (ed.), *The Cambridge Companion to Aristotle* (Cambridge: Cambridge University Press, 1995), p.27-65
- Sorabji, Richard, *Time, Creation and the Continuum: Theories in Antiquity and the Early Middle Ages* (Chicago: University of Chicago Press, 2nd ed 2006)
- Stone, J. V., N. M. Hunkin, J. Porri, R. Wood, V. Keeler, M. Beanland, M. Port, and N. R. Porter, 'When is Now? Perception of Simultaneity', *Proceedings of the Royal Society B* 268:1462 (2001), p.31-38
- Stump, Eleonore, and Kretzmann, Norman, 'Eternity', *Journal of Philosophy* 78 (1981) p.429-458
- 'Prophecy, Past Truth, and Eternity', *Philosophical Perspectives*, 5: *Philosophy of Religion* (1991), p. 395-424
- 'Eternity, Awareness, and Action', *Faith and Philosophy* 9 (1992), p.463-482

Susser, M., and Susser, E., 'Choosing a Future for Epidemiology: I. Eras and Paradigms', *American Journal of Public Health* 86:5 (1996), p.668-673

Swinburne, Richard, *The Coherence of Theism* (New York: Oxford University Press, 1977)

— *Space and Time* (London: Macmillan, 2nd ed. 1981)

Tanner, Kathryn E., *God and Creation in Christian Theology: Tyranny or Empowerment?* (New York: Basil Blackwell, 1988)

Tooley, Michael, *Causation: A Realist Approach* (Oxford: Clarendon Press, 1987)

— *Time, Tense and Causation* (Oxford: Oxford University Press, 1997)

Trout, J. D., 'Scientific Realism' in Robert Audi (ed.), *The Cambridge Dictionary of Philosophy* (Cambridge: Cambridge University Press, 2nd ed. 1999)

Van Hook, Jay M., 'Knowledge, Belief, and Reformed Epistemology', in Michael Peterson et al, *Philosophy of Religion: Selected Readings* (Oxford: Oxford University Press, 1996), p.321-329

Wierenga, Edward R., *The Nature of God: An Inquiry into Divine Attributes* (Ithaca: Cornell University Press: 1989)

— 'Timelessness Out of Mind: On the Alleged Incoherence of Divine Timelessness' in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.153-164

Wilde, Oscar, *The Picture of Dorian Gray*, (Oxford: Oxford University Press, Oxford World's Classics Ed., 1998)

- Wippel, John F., 'Metaphysics', in Kretzmann, Norman, and Stump, Eleonore (eds.), *The Cambridge Companion to Aquinas* (Cambridge: Cambridge University Press, 1993), p.85-127
- Wohlschlager, Andreas, P. Haggard, B. Gesierich and W. Prinz, 'The Perceived Onset Time of Self- and Other-Generated Actions', *Psychological Science* 14:6 (2003), p.586-591
- Wolterstorff, Nicholas, 'God is Everlasting', in Michael Peterson et al, *Philosophy of Religion: Selected Readings* (Oxford: Oxford University Press, 1996), p.125-133
- 'Unqualified Divine Temporality', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.187-213
- 'Response to Paul Helm', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.69-78
- 'Response to Alan G. Padgett', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.120-123
- 'Response to William Lane Craig', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.170-174
- 'Response to Critics', in Gregory E. Ganssle (ed.), *God and Time: Four Views* (Downers Grove: InterVarsity Press, 2001), p.225-238
- Yarrow, Kielan, P. Haggard, R. Heal, P. Brown, and J. C. Rothwell, 'Illusory Perceptions of Space and Time Preserve Cross-Saccadic Perceptual Continuity', *Nature* 414 (2001), p.302-305
- Zahar, Elie, 'Why Did Einstein's Programme Supersede Lorentz's?', *The British Journal for the Philosophy of Science* 24:2 (1973), p.95-123
- Zhang, Yuan Zhong, *Special Relativity and its Experimental Foundations* (Singapore: World Scientific, 1996)

Zimmerman, Dean W., 'God Inside Time and Before Creation', in Gregory E. Ganssle and David M. Woodruff (eds.) *God and Time: Essays on the Divine Nature* (Oxford: Oxford University Press, 2002), p.75-94

